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ORIGINAL ARTICLES.

INDOL: ITS RELATION TO PROLONGED SUPPURATION AND LARDACEOUS CHANGE.[1]

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In demonstrating the proteids of food as the normal, and therefore the most constant factor in the production of indol, one must not overlook the disintegration of albuminoid tissue. To do so would be a serious omission, for the recognition of an intense indican reaction as a valuable aid in diagnosis, and its general adoption as such by the medical profession must rest largely upon its relation to suppuration and allied degenerative processes, as in the necrosis of syphilis or carcinoma. Indol is set free whenever any of the following processes exist: 1. Suppuration in a closed cavity. 2. Continued suppuration with a free outlet. 3. Ulceration or necrosis of tissue.

As regards the intensity of an indicanuria from either of the first two causes, three factors must be considered: *a*, the length of time in which the purulent fluid has been secreted; *b*, the adaptability of the enclosing surfaces for absorption; *c*, the extent of surface available for absorption.

1. In the case of a sac normally secreting a serous fluid, simple increase in that secretion would not indicate indol formation. And inasmuch as transformation to a typic purulent secretion is a matter of several stages, it is but reasonable to expect at first only a slight indicanuria. And further, when pus is fully formed, the indican reaction will become more and more intense in proportion to the length of time that suppuration persists. This is especially true with regard to the empyemas of childhood, the reports of my examinations in connection with which are here given:

H. G., four ounces pus, urine loaded with indoxyl pot. sulph. (indican); B. I., five ounces pus, urine loaded with indoxyl pot. sulph.; R. J., ten ounces pus, urine loaded with indoxyl pot. sulph.; E. C., eight ounces pus, urine loaded with indoxyl pot. sulph. (five months' duration); K. M., twenty-four ounces pus, urine loaded with indoxyl pot. sulph.; L. I., ten ounces pus, urine loaded with indoxyl pot. sulph.; B. M., eight ounces pus, urine loaded with indoxyl pot. sulph.; F. N., seven ounces pus, urine loaded with indoxyl pot. sulph.; G. B., seven and a half ounces pus, urine loaded with indoxyl pot. sulph.

In addition to the above, I have examined a large number of cases of broncho-pneumonia, lobar pneumonia, and simple pleurisy with effusion; yet never have I found in any of these a heavy deposit of indigo blue as in empyemata. I have never seen but one single case of pythorax in children in which the presence of a marked indoxyl potassium sulphate reaction, did not accurately foretell a large amount of pus. In the one exception mentioned, the previously seropurulent fluid had become purulent but a couple of days before operation.

One case in which the accuracy of this test was upheld has fixed itself strongly upon me. B. S., operated upon for empyema, and later the sinus closed very rapidly. Temperature had been normal for some time, but rose suddenly and retention was feared. Before aspirating through the scar, a test case was made of the indoxyl reaction, and upon examination none found. A diagnosis of "non-retention" was then made and proven correct by aspiration as well as later developments, for the classic symptoms of typhoid fever soon appeared and a Widal reaction was obtained.

Indol and empyema of the gall bladder.—I. C., aged 32; history of severe colicky pains in right hypochondrium together with jaundice, fever, chills and general malaise. On palpation a distinct mass could be made out occupying site of gall bladder. A heavy deposit of indigo blue was obtained from the urine and a diagnosis of empyema of the gall bladder was made, the indicanuria ruling out a collection of gall stones. In these cases it will be necessary to have the bowels thoroughly evacuated, else indol formation in the intestine may be excessive and misleading. Such a case has come under my notice.

Indol and abscess of the liver.—I. B.; all physical signs of liver abscess. Indoxyl reaction intense. Upon operation multiple abscesses found and large amount of pus evacuated.

Indol and perinephritic abscess.—*a.* M. S., perinephritic abscess rupturing into pleural cavity; large amount of pus evacuated; indoxyl reaction heavy. *b.* T. C., supposed perinephritic abscess; there being temperature and a tumor. Indoxyl examination showed only a trifling increase over normal, such as would result from digestive disorders, but not such as would come from pus. The diagnosis of renal calculus being therefore made was found upon operation to be the correct one. *c.* I. B., pyonephrosis and perinephritic abscess; very marked indicanuria.

Indol and bronchiectasis.—*a.* E. F.; typic physical signs; very foul odor of breath; indoxyl reaction intense. Upon aspiration of cavity two and a half ounces of pus were withdrawn. *b.* S. B.; bronchiectatic cavity; odor of breath intensely fetid; purulent matter coughed up; indoxyl pot. sulph. heavy.

Indol and subdiaphragmatic abscess.—F. T.; high fever, 104 to 105 degrees F.; great pain over diaphragm in breathing, together with extreme tenderness on palpation. There being no indicanuria a subdiaphragmatic abscess was excluded. No pus was found upon aspiration, and the following day the temperature became normal.

NOTE.—I am indebted to Dr. A. G. Gerster, Chief of the Surgical Staff, Mt. Sinai Hospital, New York, for permission to use the above statistics.

2. Continued suppuration with a free outlet does not present any very distinguishing feature. In time, however, as solid tissue, such as bone, becomes worn away the elimination of indol is most intense.

In both forms of suppuration the production of indol will be great, but the amount finally eliminated in the urine will depend largely upon the characteristics and size of the surrounding tissue. Thus, in a

[1] This paper was presented under a nom de plume and was awarded the gold medal offered by Trinity Medical College Alumni Association, Toronto. The judges were Dr. Wyatt Johnson, Dr. Adami and Dr. Rutlan, all of Montreal.

case of suppurative peritonitis, where pus is free in the abdominal cavity, the indicanuria will be inky in its intensity and in a comparatively short time, while the same amount of pus in the pleural cavity would only produce a similar degree of indicanuria in from six to ten weeks, or perhaps not even then. Assuming, for argument, a case of chronic Pott's disease with marked suppuration; by what chemic or physiologic means is indol formed and eliminated as indoxyl? The answer is made doubly difficult by our lack of knowledge as to the arrangements of atoms in the primary albuminoid molecule, a point which even the most modern researches have failed to elucidate. E. and H. Salkowsky, who have given so much time to the study of indol, have paid special attention to this, arriving at the following conclusions: "That in the putrefaction of albumin indol is not immediately liberated from the proteid molecule in a free condition, but that an intermediate product is formed, which is gradually decomposed by the further action of bacteria. This intermediate product is not, however, peptone, the quantity of which throughout the process of preparation is small and in the later stages seems entirely to disappear." Baumann, who first advanced the theory, held that the intermediate product was soluble in a mixture of alcohol and ether. From this substance (which is not biuret) we may reasonably assume that tyrosin is formed, it being the mother substance of indol. But we still find ourselves confronted with the questions, what is the antecedent of tyrosin; and, where does tyrosin become changed into indol? To even approximate an answer it is essential to consider the relation existing between the liver and tissue metabolism. Of necessity, our knowledge in this respect will be limited, for there comes a point when the processes of living tissue can not be reproduced in the test tube or crucible.

Nevertheless, from the products of metabolism we may learn much about the source. Urea and leucin, as allied products, may be of some value in these investigations. Since the synthetic production of urea it has been closely studied and many theories formed as to the site of its origin. Being such an important urinary constituent it was first believed to be a renal product, next the muscular tissues were supposed to be its seat, owing to its increase after exercise, and only lately has it practically been accepted as a product of the liver. When, however, we speak of the liver as the source of an albuminoid product, we really mean that this substance or its antecedent is deposited there by the blood, undergoes certain reducing processes and is again set free to be eliminated.

Consequently we presuppose a mother substance, bearing to urea, leucin and tyrosin the same relation that indol does to indoxyl, or indican to indigo blue; and like indoxyl circulating in the blood, probably in direct connection with the leucocytes. As a sequel to this hypothesis it must be assumed that the liver, by its reducing power, normally separates tyrosin from its unknown antecedent and finally indol is set free by a continuation of the same process. Most important as substantiating this view, are the researches of M. Nepveau and M. Villiard, distinguished French scientists of Marseilles and Paris respectively, who have shown that from the maceration liquid of certain pathologic specimens, indigo blue may be precipitated.

Nepveau first made his observations on a very limited number of cases, and after noting the results in the *Marseilles Médicale*, turned over the subject to Villiard for further investigation. The results obtained I append, together with his notes:

"Nepveau has demonstrated that by examination of the alcoholic maceration liquid of organs, one may find indol or indican a considerable time after death; in one case, in the liquid from a subject after several months, the cause of death being hematuric biliary fever. The liquid in this case has been changed four times. The alcoholic, maceration liquid of other organs than the liver did not give the reaction. I have been able by nitro-prusside of soda and 2 minims H_2SO_4, to demonstrate indol in the tumors of different cases. One should allow the liquid to remain twenty-four hours, then at the bottom may be seen an intense blue coloration. The liquid of maceration has been absolute alcohol, and we have obtained the following results:

"1. Liver. Biliary hematuric fever, very intense (Nepveau).
2. Liver. Pulmonary tuberculosis, very intense.
3. Liver. Death from trauma, very feeble,
4. Liver. Uremia, very feeble.
5. Liver. Uremia, very feeble.
6. Liver. Pylephlebitis, very intense.
7. Liver. Broncho-pneumonia and grippe, feeble.
8. Liver. Fatty degeneration, intense.
9. Liver. Atrophic cirrhosis, *nil.*
10. Liver. Cholera, intense.
11. Liver. Beri beri, feeble (Nepveau).
12. Kidney. Uremia, intense.
13. Kidney. Uremia, *nil.*
14. Kidney. Biliary hematuric fever, *nil.*
15. Spleen. Biliary hematuric fever, *nil.*
16. Spleen. Broncho-pneumonia and grippe, *nil.*"

"One may see by these remarks, that indol has been found in a number of cases. These researches are, however, on entirely too small a number of cases to enable us to arrive at precise facts as to the constant presence of indol in each pathologic organ. It will therefore always be necessary, in order to obtain an exact result, to know in each case: 1, the exact size and weight of the anatomic specimen; 2, the quality and strength of the liquid used; 3, the number of macerations."

"In examination of the maceration liquid of four successive macerations of numbers two and six, we have found in each maceration a diminution of the intensity. The reactions from kidneys, spleen and lungs are not constant, and will not permit of conclusions. But it will be admitted that the liver gave a pretty constant reaction, viz.: a characteristic indigo blue precipitate."

"The solution used in oxidizing the maceration liquid is as follows: Place in a test tube 5 c.c. of the alcoholic liquid of maceration (of a carcinoma of the liver, for example), add to it nitro-prusside of soda 5 parts, and in addition 30 parts of a solution of caustic soda, some drops of crystallized acetic acid and 4 drops concentrated sulphuric acid; make up with water to 100. There will be immediately produced on contact of the two solutions and the liquid, the coloration of indican, and very strongly so in twenty-four to forty-eight hours."

Not having as yet made use of the above solution, I can not state its powers of oxidation, but should judge them to be quite marked.

The results quoted above, while apparently most important and convincing, must be confirmed by pathologists from all sections of the country. I myself have not been as yet fortunate in securing pathologic specimens from cases of carcinoma or prolonged suppuration, but hope before long to be able to report results of such examinations.

We may assume, then:

1. That suppuration, or rapid degeneration of tissue, causes an increased amount of indol to be deposited in the liver.

2. That in such cases there will also be an increased elimination of indican.

3. That postmortem we may, by simple extraction with absolute alcohol, take from the liver the excess deposit as its oxidation product, indigo blue.

I lay particular stress on these points, bearing as they do upon the question of the nature of that peculiar tissue change known as lardaceous degeneration, and next to be discussed.

Indol in relation to lardaceous change.—It is safe to say that the tissue metamorphosis commonly known as waxy, amyloid or lardaceous degeneration, is today almost as great a mystery to pathologists as in the earlier years of the century, when Virchow wrote about it. It is, however, worthy of note that a revival of interest in this subject is being manifested, both in Europe and our own continent; much careful work being done in government clinics and private laboratories. In Europe Virchow, Krakow, Czerny, and in England Howship Dickinson, are conducting elaborate investigations, while in Canada and the United States, private enterprise is being enlisted. Three factors render research difficult:

1. It is not always possible to say definitely during life, that lardaceous changes are actually going on, for even when there is good reason for believing that the kidneys may be involved, waxy casts may be absent from the urine.

2. The cessation with death of liver metabolism leaves us with but little to work upon.

3. Even when, with difficulty, the lardaceous material has been isolated from the liver, it responds to so few chemic tests as to give small chance for experiment.

As an offset to these disadvantages, it may be said that the etiology has been limited to two causes: degeneration of tissue and suppuration; whether these occur from bacterial activity, tuberculosis, syphilis or malignant disease.

What, then, has been the result of a century of work? This can best be answered by the following statements:

1. Previous to this century, the conditions under discussion had been noted, and the term "lardaceous" applied.

2. In the early years of the century great attention was paid to this condition by the Edinburgh school, and by them the term "waxy" applied to it.

3. In 1853, Virchow discovered the peculiar bright blue reaction obtained from the corpora amylacea upon the application of iodin and H_2SO_4. From its similarity to the starch reaction with the same reagents, he named it "amyloid."

4. Later Kekule, Friedrich, Schmidt and others demonstrated its nitrogenous composition and proved it to be closely allied to the albuminoids, and not starchy.

5. Kühne submitted degenerated organs to gastric digestion for a long period, finally succeeded in isolating thus the lardaceous material, and confirmed the views of Kekule.

6. Dickinson, noting that in long continued suppuration the lardaceous changes were more intense when free outlet was afforded for the pus, advanced the theory that in the purulent discharge alkaline salts were carried away, the resulting fibrin being the morbid material.

7. Ehrlich found that anilin dyes, notably alizaria blue and indo-phenol blue, were decolorized by the normal tissue of a lardaceous liver, but unaffected by the degenerated portions.

8. Czerny claimed that the white blood cells contain the precursor of the lardaceous material.

9. Krakow and others have undertaken experimental researches by inducing suppuration in animals, that the lardaceous changes may be studied in various stages.

Many more observations and experiments might be quoted, but those given outline fairly the trend of thought. Before proceeding to further discuss the nature of this morbid material, it might well be noted, that the theory of an absolute retrograde metamorphosis, as opposed to an infiltration of new material, is no longer held. On the other hand, it is freely acknowledged that whatever material be brought to and deposited in the liver, it there undergoes an almost complete transformation by the action of the liver protoplasm. Thus the question as to whether lardacein is entirely a product of degenerated cell action, or entirely an infiltration, need not longer be discussed, for undoubtedly it exists as a result of both causes, the essential factor in its formation, its precursor, that to which the color reactions are due, being deposited by the blood; while on the other hand, the nitrogenous element, that which yields tyrosin and leucin, is due to degenerated cell action. Thoma says: "It is quite possible to conceive that a preliminary stage may exist, in which the amyloid antecedent circulates in the blood, finally to pass out into the tissues and be converted into amyloid by the action of the cells." Ziegler also believes that "amyloid-forming" material pre-exists, and its deposit induced by the lowered vitality of the whole body, is due to suppuration or dyscrasia. So too Czerny, whose researches will be referred to later, believes that the leucocytes convey the amyloid precursor.

Granting that the primary and most important factor is the deposit in the tissues by the blood of an "amyloid-forming material," what is the nature of this mysterious substance? I would here with much hesitation advance the theory that this deposit is but a derivative of indol, which retains through all changes its power of easy oxidation into indigo red and blue.

We may now note the chemic properties of lardaceous material. Lardacein has the chemic formula $C_{53\cdot6}$ H, N_{15} S and O 24.4 per cent., being thus closely allied to albumin and giving the xanthroproteid reaction, as also that of Millon. It is dissolved out with difficulty, and only by the concentrated acids and alkalies, being then converted into an acid or alkali albuminate. On boiling with acids it yields leucin and tyrosin.

The following color reactions can be obtained: Reddish-brown with iodin, violet or blue by iodin plus H_2SO_4, red by methyl anilin, red by amber green. Of all the above color tests, those with iodin are the most characteristic and important, being constant and typic. Following out the hypothesis advanced with regard to the relation between indol and the primary deposit, we must look upon the mahogany red as nothing more nor less than the liberation of indigo red from the tissues, through the powerful oxidizing powers of iodin; further oxidation to indigo blue

being afforded by the concentrated sulphuric acid used in the second stage of the reaction.

In this connection the well-known blue reaction obtained from albumin in the presence of strong HCl and oxygen, is of interest. Here too we may reasonably assume that the action of the HCl is to set free from the albumin a derivative of indol, from which in turn the oxidizing power of the atmosphere soon liberates indigo blue. Occasionally also when using Heller's test, in urines loaded with albumin, the blue coloration will appear. Halliburton first called attention to the fact, as a possible source of error in testing for indican. As a matter of fact, it will be found that such a specimen is actually loaded with indican, the fuming HNO_3 playing the same rôle as the combined action of the weaker solutions, and effecting a double oxidation, indol into indoxyl potassium sulphate, and this into indigo blue.

But striking as the color reactions of lardaceous degeneration may be, and while to me they form the strongest evidence in support of the theory advanced, other proof must be adduced, before such a connection can be accepted as even possible. These other points of similarity are here arranged in parallel columns:

The Lardaceous Material.	*(The derivative of) Indol.*
1. Occurs in chronic suppurations.	A marked and persistent elimination of indol is seen in such cases.
2. Yields tyrosin.	Is a product of tyrosin.
3. Is deficient in potassium.	Shows a marked affinity for potassium.
4. Seat of election is the liver.	Indol is deposited in the liver in suppuration.
5. Its primary factor is deposited by the blood.	Circulates in the blood and is there oxidized.
6. Gives red or blue color change with oxidizing agents.	With oxidizing agents yields indigo red and blue.

1. About this little need be said, it being acknowledged by all writers that in chronic suppurations, or other disintegrations of tissue, indol is markedly and constantly eliminated, while the very same processes are being recognized as the only factors in lardaceous change. In other words, there is etiologic unity as regards the primary factor of lardaceous material, and the indolic pigments excreted in the urine.

2. At present not much can be said about the relation of tyrosin to these changes. It may be that in this production of leucin and tyrosin from lardacein, we have a hint of certain important proteolytic functions; but the chances are that the presence of these two rare end-products can be accounted for by the destruction of the nitrogenous element in lardaceous change, the portion produced by degenerate cell action.

3. As regards the deficiency of potassium, it must be admitted that unusual attention has been directed toward this condition. Dickinson and Marcet make many observations on this point, the former going so far as even to base a new theory upon it. That there is a marked difference in the amount of potassium is best shown by the statistics Dickinson himself gives. In seven healthy livers potassium = .209. In seven lardaceous livers potassium = .169. Noting also that in cases of continued suppuration where free outlet for the pus was afforded, the resulting lardaceous changes were more extensive, he became convinced that the fibrin resulting from this loss of alkalinity, being no longer held in suspension, was deposited in the affected organs. There is no need of discussion of this theory, Dickinson himself having abandoned it. But may there not be another explanation of a fact which has been dwelt upon by nearly all modern writers on the subject? It seems possible that in the affinity of indol to potassium, we have an attempt of nature to repair this loss. While we have not as yet discovered an exact relation between lardaceous material and the indigo group, yet already enough striking similarities have presented themselves to warrant us looking closely into the matter; and of these, this deficiency in potassium, which was so marked as to have led Dickinson into advancing a new theory, may well claim once more our attention, and demand our careful investigation.

4. While it is true that, given the proper etiologic facts, lardaceous change will go on wherever there is blood supply, nevertheless it is a well known fact that the liver contains in each case by far the greater amount of this morbid material; so much so, in fact, that this organ is the one usually employed in experiments. Statistics to this effect are given by Kyber, Virchow, Dickinson and others, while the fact is in accordance with the law, "Lardaceous infiltration of organs is in direct proportion to their blood supply;" still, there is another and more important reason. I refer to the proteolytic function of the liver.

The power of proteolysis is being dwelt upon more and more by physiologists, and certainly it is of the greatest importance to all students of internal medicine. In the various changes which indol undergoes it undoubtedly plays a large part. Normally the process is probably as follows: Indol having been produced ultimately from the decomposition of proteid material, is absorbed and carried into the portal circulation. Here, under the combined oxidizing, reducing power of the blood and liver cells, it becomes indoxyl, a portion of which, either as such or in an altered form, remains stored away, as it were, in the liver. That which goes on again into the blood stream is eliminated in the feces and urine. The proof that indoxyl or its derivative remains in the liver, may be found in the researches of Nepveau and Villiard, quoted above, by which they obtained indigo blue by simple maceration of livers. These livers were from the very type of case which during life would show a marked indicanuria.

Accepting then this view, as representing the normal condition of things at the commencement of a suppurative process, it follows that, later on in the course of the dyscrasia, there will result a generally lowered vitality, affecting ultimately all finer natural processes, and producing in consequence diminished proteolytic powers in the liver. Hence there will be inability to properly oxidize or reduce indol, and pass the resulting product in part out into the general circulation. Thus there will remain in the liver an unusually large amount of an improperly reduced and indigo-forming substance, constantly increasing, and to which there will be added, as a further result of the impaired proteolytic and eliminative power, nitrogenous waste and degenerate cell products. From the union of all these there would result, in course of time, that which we know as lardaceous material.

But most important of all are the characteristic color reactions of lardaceous material. We know that the application of a watery and entirely colorless solution of iodin and potassium iodid to lardaceous organs, produces at once in the degenerate portions a mahogany red tint which has never yet been satisfactorily accounted for, but bears the closest resem-

blance to indigo red. The fact that this pigment, rather than indigo blue, should appear primarily, is of no account, inasmuch as both have the same chemic composition, there being merely a different arrangement of the molecules. The same phenomenon occasionally occurs in urine analysis, indigo red being thrown down and later under atmospheric oxidation becoming indigo blue.

Directly bearing on this question are the following classic observations of Schunck:

"1. Two distinct periods may be observed in the decomposition of indican: during the first the indigo blue is the chief product, during the second red and brown coloring matters with but little indigo blue are seen. 2. Let a watery solution of indican be boiled for some time and it then yields by decomposition not a trace of indigo blue, but only indigo red. 3. If it be boiled as before, but with the addition of alkalies, it then gives neither indigo blue nor indigo red, but only a brown resinous matter, indiretin."

The second color change, that resulting from the application of strong H_2SO_4 to the portions already stained red, is the appearance of a dark violet blue, occasionally a blue black, and very rarely a bright blue. Again the parallel is striking; the oxidizing power of the concentrated H_2SO_4 altering the molecular arrangement and converting indigo red into indigo blue. Dickinson, it is true, has explained this reaction upon another basis, that of a combination between the sulphuric acid and iodid of potassium, resulting in a precipitation of iodin which blackens the tissues. But it is to be observed that although this view was first advanced in his "Treatise on Albuminuria," published in 1881, it has not as yet met with general acceptance, nor does it help in any way to explain the previous color reaction—mahogany red.

The effect of strong alkalies must be noted here. To obtain lardaceous material for study, an affected organ is treated with caustic potash, the infiltrated portion is dissolved out and a white, flaky precipitate obtained by subsequent acidulation. This precipitate will not respond to iodin or H_2SO_4 in the usual manner, but gives only a fawn color as does a similar precipitate from a healthy liver (Dickinson). So, too, if liq. potassæ be poured over lardaceous material *in situ*, before ever that identical portion has been subjected to reagents, it loses then and there its power of giving the iodin reaction. Hence the liquor potassæ, not the acid, affects it.

Now note the effect of boiling a watery solution of indican with alkalies (liq. potassæ) as described by Schunck, *vide supra*. Then compare the reaction there obtained with that just described. In both cases we see the power of yielding an indigo red tint destroyed. In short, another indigo-producing substance has been disorganized by liquor potassæ.

The relation of indigo blue to indigo white is of great interest. A solution of indigo white or indigogen when exposed to the air gradually combines with oxygen and deposits indigo blue. On the other hand, indigo blue, though strongly resisting all chemic agents, may be reduced to indigo white by fermentation. Concentrated sulphuric acid dissolves indigo blue without destroying its color, but strong liquor potassæ completely destroys its blue. In the reduction from blue to white one atom of H is gained. After liquor potassæ has been added and the blue color destroyed the tint can not be restored. But if a reducing agent is present and an acid be added, a grayish-white substance is deposited in flakes, to which the name indigogen or indigo white is applied (Schunck).

In this experiment, taken in conjunction with our previous observations, do we not find confirmation of the hypothesis advanced, viz., that a member of the indigo group is an active factor in lardaceous change? Thus, the flaky white material dissolved from degenerate organs and finally precipitated as such, bears a strong resemblance to the indigogen or indigo white just referred to. But where is the reducing agent which it has been stated is necessary to complete the process? This may be found in the action of the liver protoplasm itself, a reducing agent of no mean power, and which in spite of advanced degeneration must necessarily retain some power; for we know that a solution of alzarin blue or indo-phenol blue (an indigo derivative) is decolorized by living hepatic protoplasm, the liver cells possessing an inherent power of reduction either by themselves or through the agency of certain ferments. This is well expressed by Gamgees: "The forces peculiar to protoplasm, unknown to us but acting similarly to heat, increase the intramolecular movements of the atoms in such a way that a loosening or splitting of the molecule occurs and an aggregation of the oxygen is made possible—primary oxidation." We term this force "the proteolytic power of the liver," and Hunter has pointed out that its variations may in part be recognized by the variations of urinary pigments.

In contradistinction to the reducing power of alkalies as liq. potassæ, may be seen the oxidizing power of certain acids, as HCl, by the following observation of Dickinson: "While the liq. potassæ added to lardaceous material prevents color reagents, HCl in weak solution increases the power of the lardaceous material to respond to iodin, the resulting tint being a deeper and more durable red." What is this but the increased liberation of indigo red due to oxidization by HCl as seen ordinarily in the test tube?

Finally, the experiments of Czerny, to which reference has been made, are of the greatest practical importance. Producing lardaceous change in the organs of animals by inducing suppuration, he was led to submit the pus cells to the combined action of iodin and H_2SO_4. To his surprise the two reactions of lardaceous tissue were reproduced. Further experiments showed also that in the leucocytes of the blood similar reactions might be obtained. In his own words: "The appearance in the pus of cells giving the characteristic amyloid reaction, the discovery in the blood of the cells and the appearance later of amyloid degeneration in the organs are facts which speak for one thing, viz., that through the leucocytes is carried a substance which must be regarded, not as a glycogen but as a forerunner of amyloid. This being my view it becomes obligatory to answer the question: Is the amyloid substance itself prepared in the blood and from it deposited in the tissues?"

The acceptance of this view will go a long way toward proving that an indigo-producing substance and not a mere tissue characteristic is the basis of the well-known color changes. For we know that indoxyl circulates in the blood, is produced in excess in suppuration and may be extracted from the liver (as indigo blue), where death has resulted from the cause. It remains but to demonstrate that the red and blue colorations of the so-called amyloid reaction are indigo red and indigo blue and nothing else. But to prove this beyond cavil will require much

time and numberless experiments. Our researches, however, will be aided by knowing that amyloid changes may be produced experimentally in animals in from four to six months.

The latest information upon the whole subject of indol production is from the able pen of Dr. C. A. Herter. Two new facts are given: one that there is in the blood that which will very quickly oxidize or reduce indol into some other form; the other that in cases of chronic indol poisoning the chief changes found were in the liver, the capillaries of the lobules being much congested and the liver cells the seat of pigmentation.

Do not these observations bear out in part the theory already advanced in this article?

SURGERY OF THE LUNG.

The Oration in Surgery Delivered at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Col., June 7-10, 1898.

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(*Continued from page 165.*)

SURGERY.

We will first consider accidents to and operations on the lungs. Then we will consider the diseases of the lungs and the applications of surgical procedures to them. We will also consider the general pathologic and surgical principles underlying operative procedures on the lung. I propose the following proposition without argument: The important diseases of the lungs are all due to foreign bodies, either mechanical or bacterial. Therefore viewing the question from this etiologic standpoint, in the present state of medical science operative procedures should be habitually performed. The general principles are: 1. To place the tissue in such condition as to increase resistance to infection. 2. To remove: *a*, foreign bodies; *b*, the products of infection, which in turn are foci for further infection; *c*, tissue injured beyond repair, which constitutes foyers of new infection.

Lung operations divide themselves into two classes: 1. Those that do not perforate the visceral pleura. That class of operations aims to convert the hard-walled cavity into a collapsible one. The necessity for these operations arises from the physics of the lung. The indication is collapse, and is met by: *a*, an opening in the soft parts, allowing air to enter; *b*, removal of bony parts, allowing air to enter and the wall to collapse; *c*, collapsing the lung by forcible injection of gas or liquid into the pleural cavity. 2. Those that perforate the visceral pleura. They are divided into: *a*, those that simply perforate the lung—pneumotomy; *b*, those that remove all or some portion of a lung—pneumectomy.

What are the pathologic conditions, on the one hand, requiring collapse, on the other limiting the advisability of operative procedure to collapse? *a*, empyema; *b*, tuberculosis that is moderately advanced—too far advanced for pneumectomy.

In considering these subjects several questions arise:

1. Is the lung, situated in its bone-bound cavity, accessible to surgical manipulation? *a*, What are the difficulties and dangers encountered in entering this cavity? *b*, To what extent may this wall be removed and replaced and what manipulation is permissible within the chest?

2. What is the effect of opening the pleura—of pneumothorax? *a*, Immediate—1, with adhesions; 2, without adhesions. *b*, secondary. How can its dangers be avoided or lessened?

3. Can the lung be incised? In pneumotomy what are the dangers and limitations? They are: *a*, hemorrhage; *b*, pneumothorax—1, from opening in chest; 2, from opening the bronchi; *c*, inflammation—1, pleuritis (of same and opposite side); 2, pneumonia (traumatic); *d*, sepsis.

4. What are the pathologic conditions of the lung requiring incision—pneumotomy? *a*, hernia; *b*, injuries (infected); *c*, abscesses; *d*, bronchiectasis; *e*, gangrene; *f*, foreign bodies; *g*, tubercular cavities; *h*, hydatids; *i*, actinomycosis.

5. Can the lung be excised? In pneumectomy what are the dangers and limitations? They are: Immediate—*a*, hemorrhage; *b*, pneumothorax; *c*, dyspnea (causes and relief). Secondary—*a*, shock; *b*, dyspnea; *c*, hemorrhage; *d*, sepsis; *e*, pleuritis and pneumonia on opposite side. Best method of treating stump: Extra-thoracic, intra-thoracic, drainage or closure. Pathologic histology of repair of stump: Artery, vein, bronchus.

6. How is the chest filled after excision? What are the pathologic conditions in which excision is desirable or required? 1, Neoplasms of chest wall involving lung; 2, circumscribed tuberculosis.

7. Can the lung be defunctionalized? How may this be accomplished artificially and quiescence maintained? 1, By injections into the pleural cavity; 2, by resection of the ribs, which allows the chest wall to collapse; 3, thoracotomy, with separation of pleural adhesions and compresion of lung. What are the technical difficulties of intra-pleural injections? *a*, Adhesions; *b*, consolidations. What are its technical dangers? *a*, Air embolism; *b*, sub-pleural emphysema; *c*, pulmonary emphysema; *d*, dyspnea; *e*, sepsis—1, from without; 2, from within (1, tubercular foci, 2, septic foci). How can we determine that the injected material is passing into the pleural cavity and not into the lung tissue or bronchus? What is the most desirable material to use for injection? What are the effects of this pulmonary quiescence on the healthy lung—on diseased lung—particularly in tuberculosis? How long must a lung remain functionless that the process of repair in tuberculosis may be complete? Are pleuritic effusions beneficial or prejudicial to the repair of tuberculosis of the lung?

From the dawn of the history of medicine we find recorded cases of accidental penetrations of the chest by sharp or pointed bodies, as stakes, lances, sabres, bullets, forks, etc. The results of these accidents were hemorrhage, pneumothorax and pulmonary hernia, etc. An analysis shows that many of the cases recovered without surgical interference and that a smaller number did not even present symptoms of a grave character. With these cases as guides and inducements for surgical exploration the surgeon was slow to act on the evidence which they presented. Large portions of the chest wall have been torn away accidentally and removed for tumors of the breast without opening the pleural cavity, and no special danger was attributed to the procedures. Incisions were made between the ribs for the relief of pathologic conditions from the time of Hippocrates, still it remained for Estlander, Schede and Delagéniere to popularize the free opening and removal of a considerable portion of the bony parietes. They have shown that over one-half of the costal framework of one side of the chest may be removed without any great danger. But in their operations they had present a pathologic condition of the pleura, which formed practically a secondary inner chest wall for the respiratory apparatus. As a corollary to their procedure we find recorded a number of cases of removal of the chest wall for neoplasm when there was no such secondary thoracic wall to protect the lung; the latter collapsed and the cavity filled with air. The extent to which the chest wall has been removed in these procedures can be estimated from the operations of Kolaczek,[32] Liesrink.[33] Sedillot, in the pre-antiseptic period, resected the rib, pleura and part of an adherent lung successfully; since then Mass,[34] Kroenlein, Mil-

32 Arch. für Klin. Chir., b. 24.
33 Ibid. b. 26.
34 Verhand. des Chir. Cong., 1885.

lef and many others have opened the pleura and removed lung tissue successfully in operations on the chest wall. Cairo[35] collected twenty-seven cases and found that five died immediately after the operation and three somewhat later. He included cases in the pre-antiseptic period. In the later cases not a patient succumbed as an immediate result of the operation, so that the removal of the chest wall with opening of the pleural cavity is today a recognized surgical procedure. Weinlechner's case is an exception to the above; he removed a large myxochondroma of the rib, resected three ribs and left an opening in the chest wall as large as the palm of the hand; he was unable to secure a flap sufficient to cover the opening; tampon of gauze; the patient died of a septic pleuritis in twenty-four hours. Kroenlein[35*] in 1883 removed a large portion of the chest for sarcoma of the rib which involved the pleura; in 1887 he removed from the same patient a recurrent growth involving the chest wall, pleura and lung; the latter was separated and the cavity was drained. The patient lived for seven years after the primary operation.

What are the dangers of operation on the chest wall? They are: Shock, hemorrhage, pneumothorax and sepsis.

Shock.—The shock from injuries and operations on the chest wall, without involvement of the internal viscera or the opening of the pleural cavity, is usually very slight, as may be estimated from the extensive thoracoplastic operations which are now in vogue, and will therefore receive no special consideration.

Hemorrhage.—Injuries during operation to the internal mammary artery are not likely to occur, as operations on the lung and pleural cavity do not usually extend so close to the sternum. Accidents with fatal hemorrhage from this artery have not been frequent. Situated as it is on the inner side of the chest wall (see Fig. 9) hemorrhages from it, except when the opening is large, are mostly internal and not easy of recognition. However, the regularity of its course in the upper part of the chest close to the sternum enables the surgeon to estimate with considerable exactness the probability of its involvement in a particular injury. In eleven cases reported by Tourdes, six died; all five cases recorded in the history of the American war terminated fatally. (Paget.) The diagnosis should be based on the location and direction of the penetration, the general signs of hemorrhage, accumulating fluid in the pleural cavity with collapse of the lung and occasional external hemorrhage from the wound or hemoptysis. Where internal mammary hemorrhage is seriously suspected the surgeon should have the courage of his convictions, enlarge the wound to the pleura and if necessary resect the cartillage, then the bleeding points may be recognized and ligated. Another method suggested is the placing of a ligature upon the proximal side of the injury in the second intercostal space within a quarter of an inch of the sternum. Ligation in loco is preferable, as hemorrhage from the vein, as well as the artery, is grave. We should have no more hesitancy in opening the chest wall for hemorrhage from its arteries or from the lung than we should in opening the abdominal wall under the same conditions, as with a hemothorax already present the lung is collapsed and the effect of a pneumothorax is of little importance. The question of hemorrhage from the intercostal arteries is of great importance to the surgeon. Fatal hemorrhage from an intercostal artery has followed paracentesis and simple thoracotomy for the relief of a pleuritic effusion, and many fatalities are reported from injuries to these vessels. Paget reports twenty-three cases, eighteen of which terminated in death; fourteen of these were operated, with eleven deaths, showing what a great mortality occurs from an injury to such a small artery. It should be borne in mind that deaths did not follow extensive operations on the chest wall involving these arteries, as in the Estlander and Schede operation, as the hemorrhage in these was easily controlled, but that they followed small incised, punctured and penetrated wounds; the most dangerous condition is a splitting of an artery. The hemorrhage presents the same symptoms which guide us in the recognition of hemorrhage from the internal mammary. The indications for treatment are compression and ligation. I mention compression first in order to emphasize that it should never be relied on, either as compression from within by a plug attached to a strong silk ligature or as pressure from without. Ligature including the rib on either side of the wound is also to be deprecated. The intercostal wound should be enlarged and the bleeding point detected by the hot, pulsating stream against the end of the finger; better still, a subperiosteal resection of the rib should be made, which insures an inspection of the field and accurate localization and ligature of the bleeding points. It should be a surgical law and applicable here that when a surgeon is called to a primary or secondary hemorrhage his operation should be as radical as is necessary for the absolute control of the hemorrhage; he must not temporize, as these patients give him only one opportunity; if this is not taken advantage of they are lost.

Pneumothorax may be classed as traumatic, idiopathic (internal pathologic) and therapeutic. The apprehension of this condition has been the greatest barrier to the surgery of the chest, and still it has been one of the most common sequences to traumatism of the chest wall, as pneumothorax with or without emphysema following fracture of the rib. We ask, what are its dangers? Is the admission of air into the pleural cavity in itself a dangerous occurrence? If so, why? Is the danger due, 1, to the shock to the pleura from the admission of the air or to its absorption; 2, to compression of the lung and impairment of the respiratory exchange of gases; 3, to effect upon the pneumogastric filaments by the sudden contraction of the lung tissue; 4, to displacement of the mediastinal organs, constricting and affecting the cardiac outlets; 5, to displacement of the mediastinum, lessening the power of expansion of the other lung; 6, to increase of tension in the circulation by collapse and emptying of such a large quantity of blood from the lung into the general circulation. Different observers attribute the unpleasant effects produced by pneumothorax to the above-mentioned causes. That there is little shock or discomfort produced by the admission of air into the pleural cavity has been shown by numerous accidents to the chest, experiments and operations extending from the time of Hippocrates to the present day. The infrequency of unpleasant symptoms from traumatic pneumothorax may be estimated from the reports in the surgical history of the American Civil War; in 11,540 chest wounds, unpleasant complications from

35 Deutsch. Med. Woch., 1893, Bd. iii.

35* Berl. Klin. Woch., 1884, b. xxi, site v.

this cause were recorded in less than half a dozen (Paget). In twenty years' experience in emergency surgery of the large hospitals I have observed traumatic pneumothorax as a cause of unpleasant symptoms in but two cases; in both of these the wounds were small and situated in large bronchi near the hilum of the lung. In my recent compressions of the lung by injections with nitrogen gas, in my first case 120 cubic inches having been used, there was only a temporary dyspnea produced. The patient was up from the table within five minutes and refused to go to bed. In my second case I injected 200 cubic inches; it produced quickened respiration, a feeling of constriction in the chest, slight dyspnea and tickling in the throat. In the normal conditions of the pulmonary organs with a perfectly developed mediastinal septum the opening of the chest for the admission of air is not a grave occurrence, although pneumothorax is a more serious condition than emphysema. There are circumstances which make pneumothorax dangerous to life, as when the air is admitted into the pleural cavity through a valvular opening either from within or without; in which condition it may attain a considerable degree of pressure. In perforating wounds of the chest, even when the external wall and a bronchus are opened, pneumothorax is not a necessary sequence, as the cohesion of the pleuræ (West, Brousse) as well as pathologic adhesions prevent its formation. This cohesion must be stronger than the contractile power of the lung, which is equivalent to about 7 mm. of mercury or 3¼ inches of water. In my experiments and in operations in which no pathologic adhesions have existed, I have not observed in a single instance that the lung remained in apposition with the chest wall when the upper air passages were free. I am convinced from a careful observation and demonstration of this point in experiments that the pleuræ do not remain in contact when air is admitted into the pleural cavity, even through pin-hole openings. With each inspiratory act the lung recedes from the chest in proportion to the freedom of the admission of air. In expiration, with the contraction of the chest, the lung appears to come closer to the opening in the chest wall, while it really contracts closer to the hilum. With large free openings sufficient to admit the hand, the lung in two or three expirations collapses to its hilum and remains there stationary without the slightest effort at expansion if the balance of pressure within the pleural cavity and trachea is equal or when the greater resistance is offered in the upper air passages. An erroneous conclusion has been drawn by some experimenters, and the expression given in Paget's admirable work, "One may see the lung moving freely in respiration in an animal from which a great part of the wall of the chest has been removed. I have often made on dogs penetrating wounds on both sides of the chest larger than the opening of the glottis, and I know that an animal under these conditions lives a long time and dies only of a sort of gradual asphyxia." From this it would be inferred that the lung had an expansive power of itself, but this is not the case; the dog under such conditions lives for a time because in each rapid, jerky inspiration there is a vacuum or diminution of atmospheric pressure in the pleural cavity and a moderate filling of both lungs; but make these openings large and free and there will be an immediate collapse of the lungs in the respiratory act. With one pleural cavity open, divide the mediastinal septum so that the air passes freely into both cavities and there is an immediate and permanent collapse of both lungs without the slightest effort at re-expansion, either in inspiration or expiration. If one pleura remains intact and the other has free access of air the lung in the open pleura collapses on inspiration but expands on expiration, particularly when resistance is offered to egress of air in the upper air passages; by this method the air in the lung on the uninjured side in expiration is forced into the collapsed lung in the open side. I have shown by complete occlusion of the trachea with one pleura open and the other closed that an alternate expansion and contraction could be produced by the exchange of air from one lung to the other, the collapsed lung expanding in expiration and contracting in inspiration, the other lung performing the reverse of this action.

The first opportunity to observe this action of the lung in the human subject was afforded me in the case of a policeman injured by the explosion of a bomb in the Haymarket riot May 4, 1886. A considerable portion of the lower part of the right chest was carried away; the opening was so large that the hand could be inserted into the pleural cavity. The lung could be observed contracting slightly in every inspiration; with the mouth open and the upper air passages free it expanded but very little in expiration; if, however, the upper air passages were closed when the patient expired the lung filled the entire chest cavity, and when an effort at coughing was made a hernia of the lung resulted. The patient succumbed in thirty-eight hours from the effect of continued hemorrhage from extensive laceration of the liver.

A second case, a bullet wound in the seventh intercostal space on the left side in the post-axillary line. The man stated that his antagonist shot from the left and behind. The question arose, was the diaphragm penetrated, and if so, was the stomach injured? The house surgeon, under my direction, enlarged the opening, resected the ribs to examine the diaphragm and stomach through the chest, which was the easiest route. It was found when the chest was opened that the bullet had penetrated the diaphragm about two inches from the chest wall; this opening in the diaphragm was enlarged and the finger inserted into the peritoneal cavity; the stomach was found uninjured and the opening in the diaphragm was closed. The wound in the lung could be readily examined; when coughing was produced the lung protruded from the chest wall, when he inspired it again contracted, it could be easily retained in the wound. The admission of air to the pleura produced no unpleasant symptoms, it only increased the frequency of respiration.

A third case, Miss M., admitted to Mercy Hospital June 11, 1896, for the drainage of a small cavity situated in the upper portion of the lower lobe of the right lung, under the fifth rib and between the scapula and spine. In resecting and elevating the rib the pleura was torn, the lung immediately collapsed and could be seen expanding on expiration and contracting on inspiration. The pleura in the neighborhood of the opening was irritated and the flap replaced; the intention was to perform a second operation after adhesion of the lung had taken place. The anesthetic was suspended when the chest was opened, there was no marked dyspnea and the respiration was only slightly increased after the patient was returned to bed. She felt no inconvenience nor discomfort from the resulting pneumothorax. The quantity of expec-

toration rapidly diminished and when she left the hospital it was only about one third of what it had been previously. Two months later it was still more reduced and she refused to return to the hospital for the completion of the operation. May 20, 1898, I succeeded in locating this patient and made an examination. I found the cavity had increased in size and the quantity of expectoration was about double what it had been when she was first admitted to the hospital. She still refused operation.

It is not believed that the absorption of the air by the pleura produces any deleterious effects; as a rule it takes place slowly; cases have been reported in which the air disappeared from the chest very rapidly. Fowler and Godlee state that a quantity of air sufficient to give a tympanitic note all over one-half of the chest completely disappeared in three days. If the air remains long in the chest the oxygen is absorbed and the carbon dioxid and nitrogen remain. In my experiments, injecting the chest with nitrogen, it was found by means of the radiograph that at the end of five weeks there was scarcely an appreciable diminution of the quantity of gas in the pleural cavity. This demonstrates that pure nitrogen gas is very slowly absorbed. The length of time required for the absorption of a given quantity of sterilized air by the pleura can be easily determined by repeated X-ray exposures. The above mentioned experiments as well as the clinical effusions into the pleural cavity demonstrate that the dyspnea and other unpleasant symptoms of pneumothorax are not due to the diminished respiratory exchange from compression, nor due to the effect on the pneumogastric by the contraction of the lung.

There are no definite data to show that the sudden contraction of the lung upon the terminal filaments of the pneumogastric has any effect in producing the unpleasant symptoms that occasionally occur in pneumothorax. I do not see any good grounds for believing that the displacement of the mediastinal organs produces a kinking of the large arterial or venous trunks at the diaphragm and in that way hampers the heart's action. We have the same degree of displacement of the mediastinum with effusion and hemorrhage without these unpleasant effects. We can allow, experimentally, the mediastinal contents in dogs to pass far to the left, and if they are immobilized there the dog's respirations are but little interfered with. This condition would apparently place the vessels at their greatest disadvantage as far as the outlets in the diaphragm are concerned, still produce no marked effect. It has been suggested that the increased blood pressure by the large quantity of blood forced into the general circulation by the contraction of the lung produces the unpleasant symptoms of pneumothorax. This theory is very far-fetched and I recall no analogous train of symptoms produced from increase in blood pressure by its being forced into the general circulation from other parts of the body. The most pronounced and dangerous manifestation observed in my experiments was when a medium sized opening, two inches in length, was made in an intercostal space and the air allowed to pass in and out with *some* opposition. The lung on the open side gradually contracted to the hilum; the mediastinal septum and contents flapped to and fro in respiration like a sail during a lull; when the dog inhaled, the mediastinal septum concaved greatly to the uninjured side; when he exhaled, it convexed to the opposite side. The chest ceased to be a cylinder for the piston, the diaphragm, in the respiratory act. The mediastinal septum became a second diaphragm which contracted and destroyed the aspirating or piston power of the true diaphragm. With this motion of the septum there was comparatively no exchange of air in the lung, there was merely a variation in the shape of the lung; the septum soon became emphysematous and ruptured. The dogs in this experiment had rapid, panting respiration, which shortly ceased. The respiration could be easily restored by placing the hand over the opening in the chest wall with the diaphragm either concave or convex; by keeping the hand in position for a few minutes, the cyanosis would disappear and the animal reacted to his normal condition, proving that it was not the displacement of the mediastinal organs to right or left, not the diminution in the respiratory area, but the absence of secure pressure which forced the air out of the lung on the healthy side in expiration and aspirated it in inspiration. The mechanism of this action can be readily demonstrated on a half-filled rubber bag. I am convinced that the dyspnea following opening of the pleural cavity is due to the vibration of the mediastinal septum and contents destroying the piston action of the diaphragm.

In support of this theory I wish to call attention to the methods of relief reported by different operators in cases of dyspnea following opening of the pleura in surgical operations on the lung or pleura. The operators closed the opening regardless of the condition of the lung, as far as contraction and expansion were concerned, still the patients were relieved. Delagéniere filled a pleural cavity with water to prevent dyspnea after he had resected the rib and removed a very large quantity of pus from the cavity. It can be seen from this case that the respiratory area was not increased, the quantity of blood in or out of the lung was not changed and the pneumogastric filaments were not interfered with, but the chest cylinder was rendered complete by the immobilization of the mediastinal septum. Covering the opening in the chest with gutta percha to prevent the intake and egress of air would have accomplished the same result. When a drainage tube has been inserted into the pleura and dyspnea occurs the occlusion of the tube relieves it.

I found that by placing a forceps on the collapsed lung and drawing it into the opening the dyspnea was immediately relieved and respiratory movements were at once resumed, a forceps placed on the hilum of the lung immobilizing the septum had the same effect. I also noted that if the lobe were secured in the aperature and only partially filled it, it did not take part in the respiration, but the dog was relieved, due I believe to the steadying of the mediastinal septum. The plugging of the trap door orifice with the lobe or suturing it to the margin was the best method for relief of the dyspnea. Carl Bayer (*Prag. Cent. für Chirur.*, Leipsig, 1897, s. 37), when operating in a case drew up the collapsed lung and sutured it to the margin of the wound. The symptoms of dyspnea and collapse disappeared and this portion of the lung filled and emptied in respiration.

Infection of pleura.— There is great danger of infection when the pleural cavity is opened; this is particularly true in experimental work. The greatest fatality in operations on the lung in dogs and monkeys has been from a suppurative pleuritis, not alone on the side which was operated but on the opposite side; this was emphasized in the detailed reports of the

experimenters, Gluch, Bloch, Schmid and Biondi. Just why a pleurisy should so frequently occur on the opposite side is not known, unless that in the dog the infection is transmitted through the thin mediastinal septum. The same pathologic condition has been noted by surgeons in the removal of tumors of the chest wall in which the lung was involved. The pleura of the dog is much more susceptible to infection than the peritoneum, or better, it has less power to resist infection than the peritoneum. The pleuritis may be of the dry fibrinous variety, or it may be associated with a large serous effusion. (Note experiment on April 24, in which the effusion was so great as to fill the pleural cavity on the side operated and to compress the lung on the opposite side.)

Septic pleurisy of a virulent and fatal character takes place with pneumothorax when there is a rupture into the pleura of a septic accumulation which previously communicated with the external air, as a bronchiectatic cavity, gangrene, suppurating or tubercular foci, subphrenic abscess, etc. West, Walsh and Fraentzel claim that 90 per cent. of all cases of idiopathic pneumothorax are due to tubercular phthisis. Havershon, in 1357 postmortem examinations of phthisical subjects at the Brompton Hospital, from 1885 to 1896, found that septic pneumothorax had occurred in 87. Paget reports a case of septic embolus of the lung and pneumothorax occurring in typhoid fever. Rupture of the lung has taken place through the alveoli without any recognized pathologic condition. T. E. Adams[36] reports a case of pneumothorax with rupture of lung from an occlusion of the glottis. The dyspnea was sudden in making its appearance; there were marked physical signs of pneumothorax; its disappearance was rapid; the air was entirely removed in three weeks; there were no symptoms of inflammatory trouble in the lung; the author attributes this fact to the arterial and venous ischemia induced by compression. J. Ashhurst, Jr., reports a similar case following contusion of the chest with glottis closed; no fracture of ribs; it was followed by emphysema and hydrothorax; patient recovered without operation. Pneumothorax has been present in numerous cases of subphrenic abscess rupturing into the pleural cavity.[37] Pneumothorax associated with these infective processes has a great mortality; few, however, of the cases die immediately; most of them succumb to the secondary effects of the pleuritic infection.

Diagnosis of pneumothorax.— The diagnosis of pneumothorax, either traumatic or idiopathic, is not difficult. The latter (idiopathic pneumothorax) is due principally to tuberculosis; 3 to 8 per cent. of tubercular cases have pneumothorax (Eichorst, Guttmann, His). The absence of respiratory sounds, the distant bronchial breathing, the tympanitic percussion note, the displacement of the mediastinal contents and diaphragm, the bulging of the intercostal spaces and, if needed, the more positive evidence of the radiograph, confirm the diagnosis.

Treatment.— The treatment of pneumothorax depends upon the indications in the individual case. The traumatic cases rarely require surgical interference. Where, however, the displacement of the mediastinal organs is great and the dyspnea is distressing, it is an indication that there is a valvular opening which, with the jerky inspirations and frequent coughing, has produced a plus pressure in the pleural cavity on the injured side. This is often associated with an accumulation of blood and serum and may readily be relieved by a paracentesis or by the introduction of a small trocar protected with cotton after the manner of a culture tube protection. The question would naturally arise, should paracentesis be performed in every case? It should if the relief of the air and fluid in the cavity were the only considerations, but as there is a laceration of the lung which must be closed, that organ is held compressed and immobilized by the air while repair of the lesion takes place. If the lung were allowed free expansion it would require a much longer time to heal the laceration and if the air were aspirated from the chest it would refill through the original rupture. If the trocar is not convenient and the symptoms are alarming, the scalpel may be used to make an opening close to the upper margin of the ninth rib directly below the angle of the scapula; Fraentzel and Senator favor this incision. Netter has shown that tubercular bacilli are always present when the pneumothorax is due to the rupture of tubercular foci in the lung, and that pyogenic and saprogenic germs are frequently found. The majority of cases of penetrating wounds of the chest pass through an aseptic course to recovery. When, however, the symptoms of septic pneumothorax with effusion are present, there is positive indication for immediate and free incision. The scalpel of the surgeon is too often withheld in this class of cases until the patients have passed beyond the possibility of recovery with its aid. An incision here can do no harm, can be performed with a local anesthetic and will save many lives if resorted to early. This rule with additional emphasis should govern the treatment of idiopathic pneumothorax, as it is practically always associated with septic pleuritis of a virulent type; if curable at all it is by early drainage, in occasional cases, in the early stage, irrigation with physiologic salt solution; later, possibly with a slight stimulating antiseptic. I believe irrigation of pleural cavities greatly overdone; the same may be said of irrigation of wounds in general. Free drainage is all that is necessary after the surface is once granulating, which practically protects it from infection and absorption by the exosmosis of the fluids. Perforations of the lung close rapidly, therefore the drain should be removed as early as possible. The treatment of pneumothorax resulting from operations on the chest wall will be considered under pneumotomy and pneumectomy.

Hernia of the lung is a very rare occurrence; there are occasional cases mentioned through the literature, the histories of which are very interesting. Hernia may be divided into two classes, simple and compound. The former, simple, includes those with internal laceration of the chest wall without an opening through the skin, and are produced by blunt objects which fracture the ribs or perforate the internal thoracic wall in the intercostal spaces. The compound are those associated with penetrating wounds of the thorax; here the lung is exposed in the wound or protrudes through the chest wall. The mechanism which produces the protrusion may be readily understood. The contractions of the chest wall on the same and opposite sides compress the air in the lungs; the opposition afforded the egress of air in the upper air passages produces intra-pulmonary tension which is relieved by the escape of the lung through the fissure. It is

[36] London Lancet, 1887, Vol. i, p. 799.

[37] Inter. Clin., Philadelphia, 1894, Vol. iii, pp. 159-161.

surprising what little pressure placed on a rubber tube inserted in the trachea is necessary to cause the lung to protrude many inches through an opening in the chest wall. A pressure equal to four inches of water suffices. A hernia may or may not have a true hernial sac of pleura, depending upon its etiology and the rapidity of its formation. In hernia of the lung we do not include the protrusions of the lung above the first rib into the triangular spaces of the neck when they are not associated with injury, nor that produced at this point by artificial respiration, as the case of Chosu of Brussels. The symptoms and the physical signs with the location of the protrusion are so characteristic that they can scarcely admit of error in diagnosis. An exception to this is when a hernia is associated with emphysema.

Treatment.—The question of treatment of the first class of cases, simple hernia, can be disposed of by fulfilling the indications of reduction and retention. The latter may be accomplished by a compress, which should be inelastic and fit the opening snugly. If the case has become chronic, operative treatment for closure of the opening in the chest wall may be instituted (Tuffier's and Reclus' cases). Compound hernia of the lung forms one of its most interesting though not practical pathologic conditions, as the accident is so extremely rare. I consider the cases reported of great value as an index of the extent to which the lung may be interfered with in a surgical way. I take the privilege of quoting verbatim from Paget the case of Rolandus, published in the year 1499: "Called to a citizen of Bologna on the sixth day after his wound, I found a portion of his lung issued between two ribs; the afflux of spirits and humors had determined such a swelling to the part that it was not possible to reduce it. The compression exercised by the ribs retained its nutriment from it, and it was so mortified that worms had been developed in it. They had brought together the most skilful chirurgeons of Bologna who, judging the death of the patient to be inevitable, had abandoned him. But I, yielding to his prayers and to those of his parents and friends, and having obtained the leave of the Bishop, the master and the man himself, I yielded to the solicitations of about thirty of my pupils, and made an incision through the skin, the breadth of my little finger-nail away from the wound, all round it. Then, with a cutting instrument, I removed all the portion of the lung level with my incision. The wound resulting from this resection was closed by the blood issuing from my incision, and was dressed frequently with the red powder and other adjuvants. By the grace of God it cicatrized and recovery took place. It is true that one had to wait long for it. The patient, with his master, Rolandini, has since then made the voyage to Jerusalem, and has returned in good health. If you ask me what I should have done in this case if I had been called to it at once, I answer that I should have dilated the wound with a small piece of wood, keeping the lung warm with a cock or a fowl split down the back, and should then have reduced it, and kept the wound open till the portion of the lung was wholly mortified. If you still question me, to know how this man can live without his lung, I answer that the part remaining within the chest profits by the nutriment destined for the whole of the lung, and so is developed, and that nature has been able to create supplementary parts in it, which is an easy thing in an organ which is soft and near the warmth of the heart."

A similar case was reported by Tulpins in 1674, in which the protruding portion was ligated and cut off with the scissors. Convey collected fourteen cases treated by removal of the protruding lung, with twelve recoveries. A. Demons reports a successful case. The method of treating the stump in these cases consisted of ligation, with retention of stump in the wound, amputation with the cautery, or dressing with antiseptics and allowing the lung to slough or dessicate, as the tendency might be in the individual case, depending upon the circulation.[38] The fact that this class of cases recovered, after pneumectomy with the retention of the stump in the wound, led me to the experiment of amputation of the lung with extrapleural treatment of the pedicle and the production of primary hernia of the lobe, to be removed with secondary amputation. In compound hernia it is not necessary that the protruded portion should be amputated; if seen early it is better to cleanse and return the lung and resort to drainage of the most dependent portion of the cavity, close the opening in the chest by suture of the separate layers, and if necessary by a catgut suture of the fractured ribs.[39]

Wounds of the lung.—This subject is so extensive, and the cases are so common, that a volume might be devoted to their enumeration and analysis; still, they may be so grouped into classes for their general consideration that it will only be necessary to cite cases typic of each class. We will include here the cases of secondary infections following fracture of the ribs, stab, bullet and pointed object penetrations. Infections following simple fractures of the ribs are very rare, considering the frequency of this injury. They are readily diagnosed and the treatment should be the same as that for compound infected injuries, considered later. A case illustrating the secondary infection following fracture of the ribs is reported by Maydl,[40] in which a large quantity of the purulent fluid was removed from the lung three weeks after the accident, the pleura having been drained of blood and serum immediately after the injury; case recovered.

Stab wounds of the chest are common, but are rarely associated with serious symptoms. I recall a case which occurred in the Cook County Hospital; a patient received fourteen stab wounds in the posterior wall of the chest with a knife-blade 2½ inches in length; many of these perforated the chest wall, still the patient suffered no serious inconvenience; there was a slight pneumothorax and hemoptysis for the first two days; the temperature did not exceed 100 degrees at any time and he made an uneventful recovery. This is illustrative of the ordinary course of stab wounds of chest with pocket knives. The lung, like the intestine, is not injured by a stab wound unless it be adherent or the penetration takes place at its hilum or mesentery. Hemorrhage, pneumothorax and hemoptysis are not common after stab wounds. The indications in these cases are to clean and seal the external wounds; administer the necessary medicines to prevent coughing; never probe or explore; refrain from protracted examinations, and allow the patients to remain in the recumbent position. If infection follows they should be treated the same as infected bullet or other penetrating wounds.

Bullet wounds of the chest produce a great variety of pathologic conditions, and still a very large percent-

[38] Bull. et mém. Soc. de Chir. de Paris, 1886, N. S. 12, p. 450.
[39] H. Hayberter: 1890, Lancet, 1893.
[40] Wien. Klin. Runds., June 23, 1895.

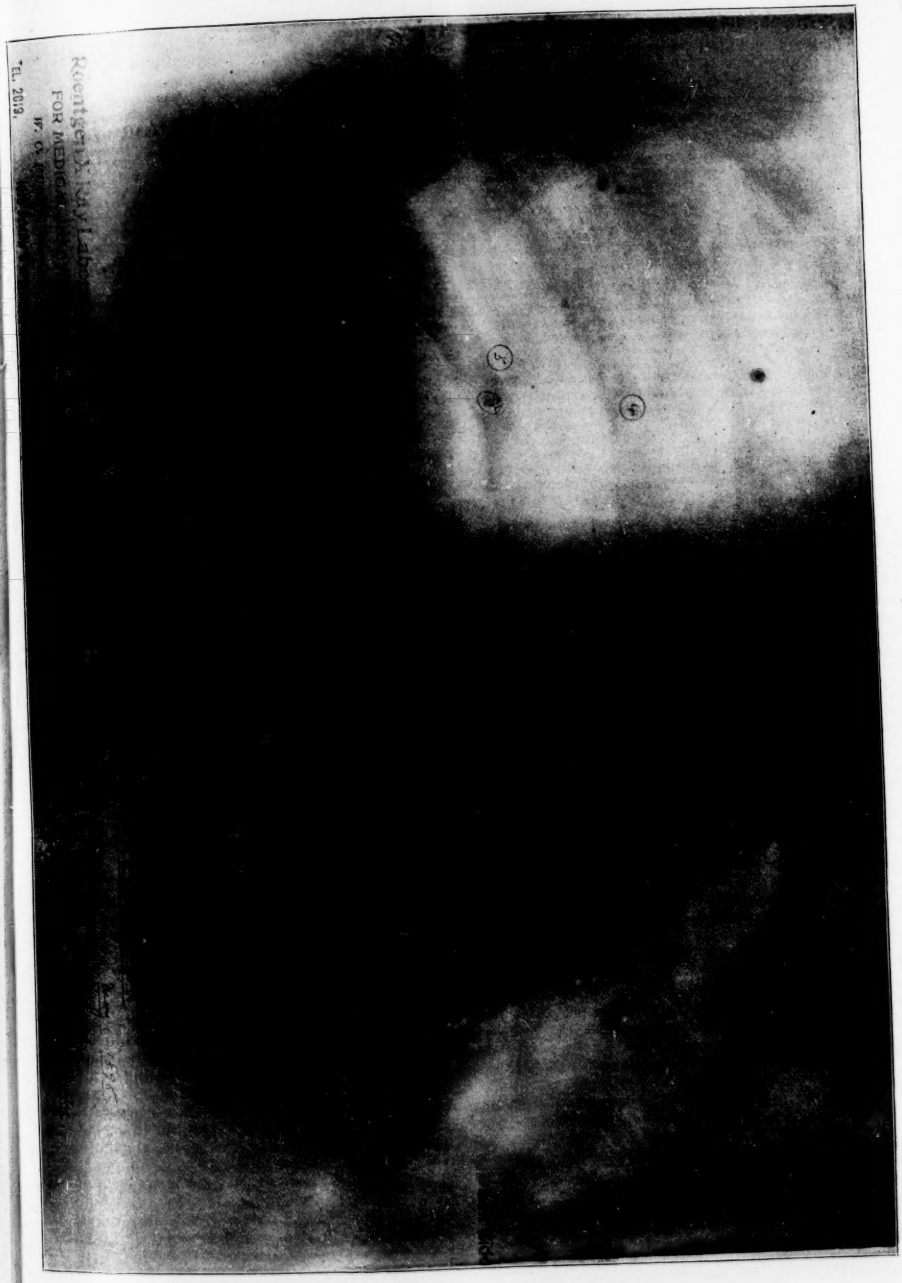
age of the cases pass through an uncomplicated course to recovery. This great difference in the course and results of cases is due to the portion of the lung penetrated, the size and character of the missile, the involvement of the large vessels and bronchi, the presence or absence of infective material and the sequence of infection. Penetrations of the periphery of the lung by bullets, as a rule, do not produce serious symptoms; there is but slight hemoptysis; this is estimated to be present in less than 20 per cent. of the cases of bullet perforations of the lung; its presence does not positively indicate perforation, though practically it has that significance; there is no appreciable hematothorax; shock, pallor, feeble pulse, apparent anemia in bullet wounds of the lung do not necessarily mean hemorrhage, as they are often pronounced when there is no appreciable quantity of blood in the pleural cavity. This fact must never be lost sight of when thoracotomy is contemplated for the relief of hemorrhage. There is usually diminution of the respiratory action on the injured side and occasionally a limited pneumothorax; on the third or fourth day after the injury there may be evidence of a circumscribed traumatic pneumonia which rapidly subsides and then the patient is convalescent. Contrast this with the course of a case in which the bullet penetrates the hilum and is associated with severe intra-thoracic hemorrhage. The patient, after the injury, is collapsed, becomes pulseless, his respirations are increased in frequency and are of a sighing character; the lung on the injured side has collapsed and within a short time the patient succumbs. This is the class of cases in which surgical interference can not be considered for the relief of hemorrhage, as they terminate fatally before surgical interference is possible. It is in cases of hematothorax where the escape of blood is slow or secondary that thoracotomy with ligation, compression or cauterization of the bleeding point comes into consideration. It has been suggested that allowing the lung to collapse would produce hemostasis. Clinical experience and experiments have demonstrated that it has no such effect, that induced pneumothorax does not act as a hemostatic and therefore should not be resorted to. In reviewing the cases of hematothorax that have been treated by open incision and ligation I have been impressed by the almost unanimous failure of mention of unpleasant symptoms from the pneumothorax produced by the operation. Whether the absence of symptoms was due to the fact that the lung was collapsed before the operation by the accumulated air or blood I do not know, but the practical fact is the same, and its clinical significance is that under these conditions the chest may be opened with little apprehension as to the pneumothorax producing unpleasant symptoms. This observation might indicate the filling of the chest with fluid or air before performing pneumotomy or pneumectomy. Of 98 cases of fatal gunshot wounds of the chest occurring at the siege of Strassburg 24 were due to hemorrhage into the pleural cavity alone. (Beck.) Of 65 penetrating wounds of the chest in military practice by Sir Wm. McCormack and Fisher 36 terminated fatally, which is a very much greater percentage than appears in civil practice. External hemorrhage is not common with gunshot wounds of the chest; occasionally there may be some bleeding from vessels situated in the outer portion of the thoracic wall. It must not be forgotten however, that in wounds of the intercostal and mammary arteries the hemorrhage is more likely to be internal than external and these small vessels should be examined first in all operative procedures. We have no means of determining without exploration whether the hemorrhage is from the chest wall or the lung itself. Quénu, Michaux, Berger, Delorme and Reclus warmly advocate surgical interference when the evidence of hemorrhage is unmistakable. Omboni[41] excised two different portions of the same lung for a bullet wound; the anterior margin of the upper lobe had a V-shaped piece removed, followed by accurate catgut suture; through the same opening of the chest a portion of the lower lobe was drawn forward, ligated *en masse* and excised; drain inserted. Patient died on sixth day. Postmortem: Fatal pyemia from sub-serratus magnus infection; stump in good condition and healing; cause of death, defective drainage of external portion of wound. V. Richards[42] successfully excised pneumocele following penetrating wound of the thorax. Delorme and Robert operated, but patients were in such bad condition that they died within fifteen minutes after operation.

From careful examination on the cadaver and from my experiments on the dog, I am convinced that many lives can be saved by early intervention in cases of intrathoracic hemorrhage either by ligature with or without amputation, suture with catgut or cauterization with the Paquélin. I have little confidence in our ability to produce hemostasis by packing such an elastic and easily infiltrated tissue as the lung; the suture is preferable and should be performed with a round needle and absorbable material; the greatest antiseptic precaution should be exercised.

The secondary changes which occur after bullet wounds, as pneumonia, abscess, gangrene, pyo-hematothorax, empyema, septicemia (sapremia) and pyemia are of much greater importance and deserve more attention than is usually given them either in the text-books or in recent monographs on this subject. The pneumonia in many cases is limited, in others it may involve a lobe or an entire lung; it often has marked evidences of acute pyogenic infection extending even to gangrene of the infected portion. Pyo-hematothorax and empyema may occur shortly after a bullet wound of the chest. The patient shows, in addition to the symptoms of depression and shock from the hemorrhage, manifestations of infection, not necessarily a great elevation of temperature but other marked evidences of septic intoxication, as dry, coated tongue, delirium, thirst, rapid respiration, etc. These symptoms usually present themselves on the third or fourth day after the injury and rapidly increase in severity until the patient succumbs from the sapremia on the seventh or eighth day unless rescued by surgical interference. The dictum of non-interference in gunshot wounds of the chest has taken such root in the profession that even unquestionable evidence of putrefaction and suppuration within the chest does not call forth active response on the part of the surgeon to afford relief. A patient with the same evidence of sapremia or septicemia in other parts of the body is immediately assisted by the surgeon, while in bullet wounds of the chest procrastination is the practice. I wish to emphasize that whenever there is evidence of putrefaction or suppuration the chest should be immediately opened and drained the same as the

[41] Bull. de Comit. Med. Cremonese, Cremona, 1884, iv. p. 228.
[42] Indian Med. Gaz., Calcutta, 1880, xv. p. 213.

RADIOGRAPH No. 4.



peritoneum or cellular tissue would be under the same conditions. I cite here a case of this class:

J. C., male, aged 27, admitted to Alexian Brothers' Hospital June, 1895; three hours previously was shot from in front with a 44-caliber bullet which passed into the chest and fractured the fifth rib; it lodged under the skin behind near the angle of the eighth rib, which was fractured. The first day he was suffering from slight dyspnea, some pain on the right side, had expectorated a small quantity of blood and had pneumothorax. The following day his temperature was 100 degrees, pulse 94, respiration 32, tongue slightly coated. At noon of the third day his temperature was 103 degrees, dulness extended up to the axillary line in the recumbent position, tongue slightly coated, and he was mildly delirious; bronchial breathing could be heard over the upper portion of the chest behind; this was probably transmitted. Fourth day—When I arrived at the hospital at 12 o'clock temperature was 105 degrees (rectal), pulse 160, respiration 42; he was cyanotic, unconscious and in a low, muttering delirium. He was placed on the table and without anesthetic a resection of the eighth rib was made at the line of fracture. The bullet and fragment of cloth were removed from the muscle wall, also a large quantity of offensive bloody debris and fluid from the pleural cavity. The opening at the point of entrance of the bullet was enlarged and an irrigation of the cavity with sterile water was made. The day following his pulse was 132, temperature 102 degrees, respiration 36; his delirium had almost subsided and his general appearance was improved. In another twenty-four hours his temperature had dropped to 100.2 degrees, his respiration 28 and pulse 124, and his general condition was still better. From this time on his improvement was rapid. The drainage tube was removed on the sixteenth day and in three weeks he left the hospital.

This case is typical of its class, and similar cases may be observed almost any time in the hospitals of large cities. The rule is, however, that they are allowed to go on to death without surgical interference, as the following case illustrates:

M. C., age 19, admitted to Alexian Brothers' Hospital May 16, 1893. A 44-caliber bullet penetrated the anterior wall of the right half of the chest fracturing the third rib. The patient was very much shocked from the injury; pulse was 130; skin cold and clammy and countenance blanched; anxious expression; there was a marked area of dulness over the lower half of the right chest; pneumothorax of the upper half; hemoptysis was continuous but not severe. The following day the patient's temperature was 101 degrees, pulse 118, respirations 54. He requested to be discharged from the hospital and under strong pressure was persuaded to remain another day. The third day his respirations were 40, pulse 150, temperature 103 degrees. He was delirious. Operation was advised but the parents would not consent. He was taken to his home, where after surgical consultation it was decided that he could live but a few hours and that interference would be futile. The death took place five days after removal from the hospital. The attending doctor told me that his condition remained about the same until the end. The postmortem revealed a penetration of the middle lobe of the right lung and the upper portion of the lower lobe. There was a fracture of the seventh rib at its angle, the bullet had dropped back into the pleural cavity. The chest was full of an offensive sanguino-purulent fluid; there was a cloudy swelling of all the tissues, no metastatic abscesses. The cause of death was acute septicemia.

This case shows how long a patient, with this variety of infection, may live after his condition seems hopeless. I might cite many similar cases from the emergency wards of the county hospital. We hope the surgery of the future will lend a helping hand to stay the mortality from secondary infection in gunshot wounds of the chest. Simple incision and drainage may be all that will be necessary, but there should not be the slightest hesitancy in resecting one or more ribs and making a free incision in the pleural cavity in its most dependent portion regardless of the point of entrance or exit of the bullet. The clinical course and treatment of penetrations with other sharp-pointed instruments is based on the same pathologic and therapeutic principles as stab and bullet wounds; the lung is rarely injured with these instruments and primary drainage is more frequently indicated.

(To be continued.)

REST—A NEGLECTED FACTOR IN THE TREATMENT OF GASTRO-INTESTINAL DISORDER.

Presented to the Section on Practice of Medicine at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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It is not within the province of my paper to enter into the discussion of the subject of rest from a physiologic standpoint. The question of rest is only being at present approached by the physiologists of the day through the study of muscle and nerve irritability, waste and repair, sleep and the still less explored domain of "fatigue." Not until sufficient experimental data will have been accumulated will we be in a position to form a rational physiologic theory of rest. I will use the word "rest" in its most comprehensive sense—the antithesis of action. Life is action, but action is made possible by the period of rest during which the spent energies are renovated. All our organs manifest periods of action and repose alternately; some are absolutely rhythmic, as the circulation of blood; others are only intermittent, as the secretions and excretions. The organs of vegetative life are so wonderfully arranged that they take their rest without asking our permission for it. Nobody can bid the heart beat 120 times a minute, neither is one able to retain his urine at will for one week. It is different with the organs of animal life. Here automatism ceases. If he will he thinks, if he will he exercises his muscles. He knows no limit except the point of fatigue, which is the threshold of the pathologic. There is another difference between the organs of animal and vegetative life. After a continuous use of any one of the organs of animal life, be it thought, sensation or contractility of muscles, there comes a period of repose during which the organs of vegetative life go on performing their functions undisturbed. On the contrary, when the organs of vegetative life have overstepped the point of fatigue, the organs of animal life invariably suffer in consequence more or less. It is well known how digestive, circulatory and urinary troubles influence the motor, sensory and intellectual functions. Rest, therefore, can be defined as nature's *prophylactic*. It not only prevents the further breaking down of tissues, but it affords the chance for the tissues to store up new energy. In the ordinary life of a healthy individual the period of activity and prophylactic rest are balanced unnoticed and unobserved. We are unable to measure the time of activity and rest. But as soon as man deviates from the normal it then becomes evident that the two must remain in a direct ratio in order to establish the equilibrium. The greater the activity that produced certain abnormal phenomena the longer must be the rest. The length of time which is required by nature for the repair of an injury must be in proportion to the severity of the injury, and the more severe the injury the longer time is required for the perfect recovery of the disturbed functions. Rest in such cases becomes a *therapeutic* agent.

Prehistoric man, I am sure, did not know of the terms prophylaxis, metabolism, katabolism, energy, etc., and yet rest has probably been his chief, and for a long time his only, remedy. Nature has insisted upon it, "even to the extent of inflicting a twinge of pain on such as disobeyed her precepts." And notwithstanding the fact that the beneficent action of rest is so obvious, and may be said to be inherent and instinctive, so much so that even animals employ it as a therapeutic agent in surgical as well as medical cases, yet it was only in the seventies of this century that the first word was spoken in the elucidation of the question of rest. I refer to the classic lectures of John Hilton on "Rest and Pain." The surgeon was the first to recognize the value of rest. In 1878 the neurologist followed and sang the praises of nature's greatest *Materia Medica*. It was our own Weir-Mitchell who elaborated in his work, "Rest in the Treatment of Nerve Disorders," a cure that bears his name, the brilliant results of which made its author known wherever medicine is practiced. Since that time it seems as if the surgeon and neurologist have monopolized "rest." It is indeed a happy coincidence that those who suffer from pneumonia and typhoid fever are unable to walk, otherwise the physician would never think of ordering them to go to bed. In our day of multiplicity of drugs, patent and proprietary, legitimate and illegitimate, nostrum and specific, when a patient presents himself, and the diagnosis is once made, the first question is: "Which of the thousand and one drugs shall I prescribe?" Surely there ought to be one which will hit the right point. The surgeon thinks first of all of rest. The neurologist tries to secure rest. The physician alone uses the pharmacopeia first, last and all the time.

True, in looking over the scanty literature on the subject of rest one finds here and there a timid voice raised apologetically for the use of rest in cardiac, pulmonary and renal troubles. But the fear of being branded a crank makes them speak in tones not louder than a whisper, and their effort is lost in the pandemonium of the "new" and "newer remedies" craze.

I wish to raise my voice many octaves above a whisper and proclaim loudly and boldly that I employ rest, nature's greatest panacea, as my first and best weapon against the greatest foe of mankind—diseases of the gastro-intestinal tract. I know that the tendency of our time is to treat diseases of the stomach by washing, scouring, scratching, punching and electrifying the stomach. The gastro-enterologists of the country have at the present time visions bright of the oncoming time when the same *modus operandi* will be applied to that poor piece of gut which measures only twelve fingers in length—when we will be able to wash, scour, scratch, punch and electrify the duodenum. Far be it from me to scorn the work of an Einhorn, Hemmeter, Stewart or Turck. There is none who appreciates more highly the services they have rendered to gastrology than I do. I can assure you that before my stomach will perform the last functions of autodigestion I will yet wash, scour, scratch, punch and electrify a good many stomachs. But I refer more to the tendency of the time, which makes everyone who reads a book on diseases of the stomach arrive at the only conclusion that lavage is the only salvation of the stomach, and that the stomach tube will "do it all."

I take the stomach and intestine to be in no way different from any other organ in our bodies: they are made up of the same tissues, are subject to the same insults, and their mode of repair is identical with that in any other part of the body. I do not see the difference between the symptom-complex called neurasthenia and that symptom-complex called nervous dyspepsia. Why apply the Weir-Mitchell treatment in the one and not in the other? I do not understand by what manner of reasoning one arrives at the conclusion that in the treatment of a painful limb, according to the maxim of Hilton, "the maximum of result is co-equal with minimum of disturbances," and that a painful stomach or painful intestine should not be accorded the same privileges. And lastly, it is incomprehensible to fathom the wisdom of prescribing rest for the weary limb, an exhausted organ, anywhere in the body except in the stomach. The only redeeming instance in the whole array of diseases to which the stomach is heir, and in which the rest cure is recognized as the remedy *par excellence* is ulcer of the stomach. The principle of the cure was laid down by Niemeyer, recommended by Ziemssen and especially elaborated by Leube. It is expressed by Ewald in the following words: "I know but one form of treatment which holds out prospects of success . . . and this is the rest cure . . . by which the stomach is protected from all irritating factors as a broken bone is immobilized in plaster."

Now, the surgeon does not draw a line of demarkation between an ulcerated, broken, bruised or simply inflamed limb. Rest is the *sine qua non* treatment. Go over in your mind the whole gamut of diseases of the stomach from a simple inflammation of the mucous membrane to solution of continuity, and you will find that the process, both pathologic and reparative, is the same. Why, then, not apply among other things the same remedy? I have done so and nature has rewarded me most generously.

How can rest be applied to diseases of the stomach and intestine, will be asked. It is true you can not put these organs in splints, but you can, by using one or all of the following methods, secure rest: 1. Rest in bed. 2. Diet. 3. Hot poultices.

1. *Rest in bed.*—In severe cases I follow the method of Weir-Mitchell to the letter: 1. Absolute rest in bed. Sitting is not allowed under any circumstances. The bowels are regulated; the bed pan is used. 2. Sponging the whole body every morning. 3. Isolation. 4. Massage. I have not had yet a case that required electricity. In milder cases I use my judgment as to isolation and massage.

2. *Diet.*—In many severe cases of gastro-intestinal disorders the best bill of fare is abstinence. One, two or even three days' fasting will do no harm in cases of ulcer, dyspepsias, and diarrheas of all kinds and varieties. Nutritive enemata can be employed in cases where a longer period of fasting is necessary. When food by the mouth is allowed it must be given in small quantities, no matter whether liquid or solid, and at regular intervals. Every case must be individualized as to the quality and quantity of food.

3. *Poultices.*—I shall not attempt to formulate a theory as to the action of poultices. Whether the poultices hasten the expulsion of food from the stomach as has been shown experimentally by Fleischer, or they cause the acceleration of the circulation of the blood in the abdominal viscera, is not yet definitely settled. I am certain, however, of one thing, and that is that they aid the peristaltic move-

ments of the stomach, they make the patient feel comfortable and keep him warm and at rest. *The poultices take the place of splints.* In severe cases the poultices are applied constantly during the day for one and two weeks. In milder cases from four to eight hours daily.

The time allotted to me does not permit me to enter into details. Each of the three forms by which rest of the gastro-intestinal tract may be secured would require a separate essay. I will therefore limit myself to the recital of the histories and results of a few cases which have undergone the rest cure.

Case 1. Referred to me by Dr. J. T. Eskridge. J. H. S., Plattville, Colo., aged 31 years, male, merchant. Family history negative. Had continued fever in 1887, lasting for two weeks. In 1890 had influenza. These two attacks left him in a weakened condition. For the last years the following train of symptoms have developed gradually: Headache almost constant, at times accompanied with pain in back; distress and heaviness after meals; burning sensation in stomach from one to two hours after ingestion of food, which is sometimes relieved by taking baking soda, oftener not. Appetite is good, bowels regular; has not lost perceptibly in body weight; suffers occasionally from jerking and twitching of muscles, has attacks of despondency and melancholy and spells of crying; once in three to four days, sometimes at longer intervals, becomes dizzy when commencing his meals; sleeps well; suffers from nocturnal emissions quite frequently; attacks of frequent urination. Physical examination of mouth, chest and abdomen negative, except a slightly coated tongue, and some tenderness over pit of stomach and transverse colon. Repeated examinations of stomach contents after various meals, at various times revealed a total acidity varying from 90 to 140. Not being able at that time to absent himself from home and to take the rest cure, he was ordered to subsist on nitrogenous diet; he was given strychnin in small doses, sod. bicarb. after each meal, lavage every other day. His symptoms were greatly mitigated. The headaches diminished both in frequency and severity; he could concentrate his mind; his weight increased. Yet he was not cured from the burning sensation in his stomach. He had to take soda every day, and at times even large quantities would not relieve.

Six months after he first consulted me he decided to try the rest cure. In addition to absolute rest in bed he had hot poultices applied to his abdomen twice a day, cold sponging every morning and his diet regulated. He was not given any soda, neither was his stomach washed. The burning sensation gradually diminished and at the end of fourteen days he was entirely free from this annoying symptom. Contrary to my advice that he remain in bed at least two weeks longer, in order to insure a permanent cure, he returned to his home. He informs me (now one year after the treatment) that he is doing well, and that only within the last two months he has once in a while the recurrence of slight attacks of heartburn.

Case 2.—J. O., female, 24 years of age. Married four years. Has no children. Parents healthy. Was well until five years ago, when she had an attack of influenza which left her with a bad cough, and she gradually grew worse. She came from Portland, Ore., to Denver two years ago. She markedly improved. For the last three months she commenced to cough and the expectorations were at times blood-streaked. Bloating and pressure after meals very annoying. At first she vomited after meals once or twice a week; later it became more frequent. Can not keep anything on her stomach for the last five days. She has retained, however, her appetite for food. She suffers from night sweats and violent attacks of coughing. Physical examination revealed dullness over the apex of and scattered areas of moist râles heard over the left lung, anteriorly and posteriorly. The stomach contents showed a great quantity of mucus and diminished acidity. She was sent to St. Joseph's Hospital; absolute rest enjoined and carried out. No food was given for the first twenty-four hours. For the next two days she was allowed small quantities of somatose. Hot poultices applied to abdomen constantly for first four days, then six hours daily. Cod liver oil inunctions daily. No medicines were given by the mouth, except a hypodermic injection of strychnin once a day. At the end of four weeks she ate meat at each meal and drank two quarts of milk without experiencing any distress after; has gained six pounds in weight, no night sweats, no harassing cough. She became pregnant five months after she was discharged, miscarried on the third month, and at the time of this writing, fourteen months after the treatment, continues in good health.

Case 3. Referred by Dr. S. A. Fisk. J. H. P.; 25 years old; student. Father's mother, and sister of patient died of lung trouble. Has had lung trouble for two years. Dr. Fisk informed me that he has "considerable infiltration on the right side of his chest, and some beginning on his left; a mitral systolic lesion with a slightly enlarged heart." For four months suffers from diarrhea; has from four to five watery stools daily. No pain in abdomen; appetite fair. Pulse 110, temperature elevated in the afternoon.

Treatment.—Absolute rest in bed. No food for twenty-four hours. Somatose for two days, and after that scraped meat and kephir. For the first five days gave orphol in five grain doses, and washed the bowels twice. After that gave strychnin, one-thirtieth of a grain three times daily. He was in bed three weeks. The diarrhea never returned. Four months after he was discharged Dr. Anderson of Colorado Springs, referred him to me for the examination of his feces, which contained some peculiar extraneous matters. As his feces did not contain at that time anything peculiar, I have examined a specimen under the microscope and found numerous ova of tænia solium. By appropriate treatment have removed without any trouble a tape worm. The patient is now (twenty months after treatment) in Switzerland and has not had an attack of diarrhea since.

Case 4.—Referred by Dr. Clayton Parkhill. F. F.; 44 years old; female. Father subject to rheumatism; mother died of a paralytic stroke. On Dec. 7, 1896, noticed a growth in the left breast, which was diagnosed by Dr. Parkhill as cancer, and which he removed. Six weeks after the operation commenced to feel pain in the epigastric region, aggravated by taking food, which continued for the last five months. Belches a great deal. Appetite fair; bowels costive. No nausea, no vomiting, no heartburn. Test meal found well digested. HCl present.

Treatment.—Rest in bed, poultices to abdomen. Meat diet and kephir. Nux vomica fifteen drops three times daily. The pains gradually subsided, and after three weeks she left the hospital cured.

Case 5.—Referred by Drs. Eskridge and Wetherill. E. S.; 42 years old; female; single. Family history negative. At 9 years of age she had scarlet fever, since which time all her troubles date. She had attacks of dysentery periodically. Intense headache, front and nape. Frequent attacks of diarrhea preceded by pain in intestines, usually over colon. Great irritability in rectum and bladder. In 1891 had a cystic tumor removed from her right breast. In June 1894 had her uterus scraped, which relieved in a measure the irritability in the bladder and rectum. Four months after the operation a tape worm was removed. In February 1895 hysterectomy was performed and the right ovary removed. The annoying symptoms were not abated in the least. In June 1895 right nephrorrhaphy was performed. In September 1896 she came under my observation, Dr. Wetherell having, after careful examination, refused to operate on her rectum, which he found in a normal condition. After watching her symptoms for some time I have come to the conclusion that she suffers from membranous enteritis, and probably has suffered from the same malady all her life. Her treatment consisted of absolute rest in bed, hot poultices to abdomen, and high irrigation in colon with a solution of resorcin. Her diet consisted of meat, kephir, bread and plenty of butter. She showed marked improvement from the start, and life was no longer a curse to her. I can not claim that she is entirely cured. The pains in her abdomen recur once in a great while, and she then sheds a good amount of membrane, but the intervals of freedom from pain and annoyance are long, sometimes lasting four and five weeks, and the attacks are never as intense. She has taken three courses of rest cure, each continuing five, four and three weeks respectively.

Case 6.—Referred to me by Dr. D. H. Coover. D. H. C.; 38 years old; married. Father and mother of gouty disposition. Enjoyed fair health when a girl. Having resided in a malarial region, she suffered from intermittent fever. For the last fifteen years suffered intensely from pain in abdomen and diarrhea. She was never free from pain more than a few days at a time; suffered from neuralgic pain in head and sciatic nerve. As far back as 1885 she noticed in her evacuation shreds of mucous membrane, sometimes a full cast of the bowel. During the last few months the pains became unbearable; she could not sleep, was despondent and very miserable. She came under my notice June 1897.

Treatment—Rest cure absolute, hot poultices. No food for the first twenty-four hours, and small quantities of somatose during the next four days. High irrigation of the bowel, with resorcin solution at first every day for five days, then once a week; five grain doses of orphol. At the end of the first week

she was rewarded for her enforced rest by having a spontaneous, well-formed stool, an event which has not occurred for many years. She remained in bed for three weeks. Four weeks after she had a slight relapse and was again ordered to remain in bed, and this time she remained for about four weeks. At the time of this writing, one year after the rest cure, she is in good health; has not had a single attack of diarrhea or abdominal pain.

Case 7.—Referred by Dr. S. A. Fisk. R. S.; 39 years old; female; Mexican. Three years ago had a bilious attack—headache, diarrhea and vomiting, lasting for one day. Since that time suffers from diarrhea. Has one well formed stool every morning, and four to five evacuations during the day, the last stool usually containing some mucous and shreds of membrane. She has never had a movement during the night. Stools are watery and very offensive. She has no pain in abdomen, no pressure or distress. Has lost twenty pounds in weight since her first attack. Took a course of treatment in Carlsbad and Paris, with only slight and temporary relief. She came under my treatment in September 1897. I have pursued the same course of treatment as in No. 6. Being of a highly nervous temperament, as soon as the diarrhea stopped she left for Tucson, Arizona, where she kept up the rest cure for some time. Dr. Rodgers of Tucson, under whose care she was, writes to me that she has no diarrhea and that her stools are perfectly normal.

Case 8.—Miss M. G.; 27 years old; medical student. Parents healthy. She enjoyed good health until within six months, when she commenced to feel pain in her stomach after meals. Pain is localized, aggravated by pressure and by taking food, and even water. The pain grew gradually worse, and her physician had recourse to opiates. No nausea, no vomiting, no heartburn, no belching, no headache. Appetite good; bowels regular. HCl 80. She remained in bed only ten days, as she was anxious to come up for examination in May (1898). Hot poultices were applied six hours daily. Somatose given during the first three days, and later small quantities of milk and lime water every half hour. At the end of the ten days she was free from pain. At the time of this writing, four weeks after the rest cure, she complains of slight pain once in two or three days.

Case 9.—Referred by Dr. Mullin of Aspen, Colo. M. B.; 52 years old; female; German. Family history negative. Fourteen years ago had an attack of typhoid fever. Seven years ago, immediately after drinking a cold glass of beer, was taken sick. At first she felt as if there was a load in her stomach, which continued for several days. She suffered on and off from abdominal pain, since. In 1893 had severe pains, and her physician washed her stomach and put her on a milk diet, which relieved her very much. Whenever she would have an attack this mode of treatment was employed with success. In January 1898 had influenza, and since that time the condition of stomach became worse. Pain is aggravated by taking food, by exercise, and is worse toward evening. The pains are especially severe from 8 to 11 P.M. No headache. Appetite fair. Bowels have been always regular; constipated since the attack of influenza. She came under my treatment May 14, 1898. The stomach contents revealed nothing abnormal. On palpation a tumor was found in the right abdominal cavity, movable on respiration, and making excursions from under the ribs down almost to the brim of the pelvis. The diagnosis of a movable right kidney was substantiated by Dr. C. A. Powers.

Treatment.—Absolute rest in bed, hot poultices, massage, cascara sagrada (Stearn's) for the constipation, and strynchin. The pain gradually diminished. After the first week she has not had a single severe attack. Sleeps well. Her appetite is excellent, and if she remains in bed for three weeks longer, I expect,[1] that with an abdominal bandage so fitted as to keep the kidney *in situ*, she will remain comfortable through her life.

ANALYSIS OF THE CASES.

I have chosen from my records of over one hundred cases treated by rest-cure during the last two years these nine cases with a view of illustrating the groups of diseases wherein I found my method to give satisfaction.

Case 1 represents a type of hyperacidity upon a nervous basis. Washing of the stomach and alkalies were of no avail. Being a case of neurasthenia with hyperacidity only as a predominating symptom, rest logically suggested itself to my mind.

[1] My prognosis came true. Patient was discharged cured, July 1.

Cases 2 and 3 represent the usual type of tubercular patients, the first suffering from vomiting, the other from diarrhea, both conditions being analogous, and only differing from one another as to the seat of the irritability in the digestive tract. To let such patients eat, drink and walk about is simply to add insult to injury. All around rest for body, stomach and intestine is clearly indicated.

Cases 4 and 9 represent types in which the suspicion of cancer is very strong. Case 4 had a cancer removed from her breast and case 9 had all the symptoms diagnostic of cancer, her age, the constant pain, the emaciation. The first case proved to be a severe dyspepsia, the other a floating kidney.

Cases 5, 6, and 7 represent various types of enteritis. It is my belief that through a mistaken diagnosis case 5 was unsexed and otherwise mutilated.

Case 6 convinced me that all cases of enteritis without an organic lesion are amenable to treatment, and case 7 presents a point of interest that membranous enteritis does not necessarily follow the letter of the text-books, and may be present without severe pain.

Case 8 represents a type of cases in which the diagnosis of ulcer or erosion of the stomach is very probable but not certain. The age of the patient, the localized pain increased by pressure and by the taking of food, and the slight hyperacidity all point to ulceration or erosion. The diagnosis may be doubtful, but the beneficent result of the rest treatment is certain.

CONCLUSIONS.

1. It is indicated in all dyspepsias, the underlying cause of which is a deranged nervous system.
2. It is indicated in all cases where abdominal pain is present.
3. In all cases of acute and chronic diarrhea.
4. In hemorrhage from the stomach or intestines.
5. In all cases of moveable or floating kidney.
6. In all tubercular cases suffering from disturbed digestion, be it stomach or intestine, and especially those that have a vacillating temperature record, and as there are but few cases of tuberculosis that do not suffer from some form of gastro-intestinal disorders, the rest cure is indicated in 50 per cent. of all cases of tuberculosis. Not only are they relieved from their annoying digestive symptoms, but their general condition markedly improves.
7. I have yet to learn of a disease of the gastro-intestinal tract where the rest treatment is contradicted.

I will close my paper by a quotation from Hilton's "Rest and Pain," which I have altered somewhat to meet the occasion. "In all diseases of no matter what nature, of the gastro-intestinal tract, when the evidence of disease is in organic lesion or in deranged function, it becomes our duty to look upon and treat the altered structures as we do contusions and laceration of soft parts and congestion of organs in any other part of the body, and to give the stomach and intestines absolute rest, to rely on nature's power to repair the injury or disturbance, and to avoid stimulants, which excite rapid circulation as much as possible. The stomach and intestines disturbed in their vital endowment become unequal to even their ordinary duties. They recover themselves slowly; they then soon become fatigued from use, and if claims are made upon them soon after injury, that is, before structure and physiologic integrity are re-required, the patient is very likely to suffer from serious dis-

ease of the alimentary tract. The stomach, as well as the intestines, requires absence from occupation, *rest*, and it should be in proportion to the severity and duration of the symptoms they present."

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DISCUSSION.

Dr. H. M. McCONNELL of Pennsylvania—I do not think there is any class of cases that require rest so much as diseases of the stomach. Rest of this organ means physiologic rest. The only way to obtain this rest is to abstain from food entirely and this can only be done to a very limited extent, when it can be carried out at all. When the Doctor gave the history of his cases he did not say what they were being treated for; in some cases it is injudicious to give nitrogenous food. Some symptoms are due to auto-intoxication, and you must improve digestion in treating these cases. Take ordinary typhoid fever, a patient that takes three or four pints of milk a day is not giving the organs physiologic rest. When you take into consideration imperfect digestion, most cases of neurasthenia are cases of auto-intoxication. Physiologic rest is very important.

Dr. TYSON of Philadelphia—In speaking upon the rest treatment of gastro-intestinal troubles the Doctor has spoken of the one thing that will do more or less good in every case of these troubles; the application of therapeutic measures in these gastro-intestinal troubles is more or less haphazard. Those who look into the subject do not receive much assistance so far as therapeutic measures go. I hope the time will come when accurate methods will produce more satisfactory results. In comparison to the rest treatment of the stomach, the Weir Mitchell method is rather analogical. In my experience food is not such a necessary factor in the treatment of these conditions as many would imagine. A patient may go one, two or three days without the ingestion of food, if he is in a position not to demand any force; food is a force-producing agent largely.

Dr. H. A. WEST of Galveston, Texas—The scope of Dr. Spivak's paper is very comprehensive, because the gastro-intestinal canal undergoes serious involvement in nearly all infectious diseases, such as rheumatism, scarlet fever, measles and diseases of that class, in which the processes of digestion are seriously involved. Rest treatment is of supreme value, not only rest so far as can be accomplished by rest in bed, but by other means. And especially as regards acute rheumatism, the prognosis in this disease as regards the subsequent cardiac complications can be made less or even averted by such a plan of rest in bed. The whole subject is so comprehensive that one can not discuss it in the five minutes allowed him. One point would require modification—as to the necessity of rest in all cases of tuberculosis. If the rest in these cases is limited to the organs of digestion and to the proper regulation of the diet, then I agree with the Doctor; but the large proportion of cases is benefited by exercise in the open air.

Dr. SPIVAK of Colorado—I have little to say in addition to what I have already said. I am thankful to Dr. Tyson for taking up the defense. I read the paper not so much to relate to you the nine cases as to urge upon you the necessity of rest in these cases. I wanted to arouse interest in the profession to one of the best methods that can be used and one which nature employs to cure disease. I have been interested in this subject many months. I am sorry that the facilities of the library here does not permit of more extended research on this subject; there are only fifteen or eighteen papers or monographs in the whole literature on the subject of rest. I have not found one school that treats of the subject of rest in gastro-intestinal disorders. I have seen good results in many cases and in none have I seen any harm result. In regard to tuberculosis, I did not mean to say that all cases should be treated by rest in bed; I said that those cases that were suffering from fever should go to bed. My opinion is based upon a good many cases observed. They feel a great deal better in bed than they do after a walk. Every patient who has a fever, when he exerts takes something away from his strength. Furthermore, I stated that patients who suffered from diarrhea or vomiting should also go to bed. I limit these cases where rest in bed is indicated in tuberculosis where there is temperature, diarrhea and vomiting.

DILATATION OF THE STOMACH, WITH REPORTS OF CASES TREATED BY DIET, MASSAGE AND INTRA-GASTRIC ELECTRICITY.

Presented to the Section on Practice of Medicine at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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There has been a tendency of late among writers to regard enlargements of the stomach as of little or no consequence, unless very excessive and complicated by such a degree of muscular weakness as to render the organ incapable of emptying itself at any time during the twenty-four hours. Some recent authors do not give any place to dilatation of the stomach as a distinct or separate entity, but describe it incidentally under the heads of motor insufficiency and obstruction at or near the the pylorus, on the ground that it is a mere sequela or consequence of one of these. But, notwithstanding the high authority which exists for a contrary view, the writer insists that there is a normal size for stomachs as much as for hearts, and that any notable enlargement of either, plus decided insufficiency, constitutes dilatation. It is granted that it is not in either case a primary disease, and also on account of the enormously disturbing influence of unhygienic diet and dress, stomachs do differ very widely in size within so-called normal limits; but even the cases called megalo-gastria by Ewald,[1] in which in consequence of excessive eating or drinking the stomach is often found twice the usual size without indigestion, are no more normal than are hypertrophied hearts in which the circulation is well maintained. The enlarged stomachs which have not yet dilated are, in fact, very frequently a cause of other pathologic conditions and of symptoms both direct and indirect, especially by displacement of the uterus.

But to follow up this line of discussion would lead too far afield. The object of this paper is to show

the amenability to treatment of a certain class of cases in which the stomach as a result usually of hygienic errors, often dating from faulty feeding in infancy, has become decidedly enlarged and weakened, cases, which while much less serious than those dependent upon pyloric obstruction, have been considered rather refractory to our usual therapeutic measures, if not quite incurable. The preponderance of such cases as well as of gastroptosis in women, even in young unmarried women in whom child-bearing can not be invoked as a cause, points to the probability that their mode of dress is a factor in the etiology.

Ewald[2] says: "I understand dilatation of the stomach or gastrectasia to be that condition of the viscus which is accompanied by the clinical symptom of disturbed gastric function due to the enlargement of the organ." This definition will answer perfectly well for the purposes of the present discussion.

Mathieu's[3] division of atonic dilatation into "temporary" and "permanent" can not be accepted, since experience teaches that by our latest resources, including intragastric electricity and abdominal massage, with the help of diet, exercise, and in bad cases, lavage, all the atonic forms of dilatation can at least be greatly improved. The mildest cases and some of the worse ones, will often yield to diet and exercise alone. The more severe ones, including even those of long standing and those complicated by gastritis, will usually improve greatly upon a careful, non-fermentable diet,[4] lavage, special exercises for strengthening the abdominal muscles and either massage of the abdomen or intragastric electricity, the choice being dependent upon the activity of the secretion of the gastric glands. Massage suits best when there is a deficiency of the gastric juice and is apt to aggravate when there is hyperchlorhydria, as pointed out in a previous paper by the writer.[5] This aggravation is especially to be apprehended from a deep, thorough kneading.

Intragastric electricity in the form of a strong faradic current is very efficient in strengthening the weakened gastric muscle and in contracting the dilated organ. As mentioned by me in a former contribution, in which is described a new intragastric electrode,[6] it will, in suitable cases, often cause a retraction of the lower border of the stomach to the extent of a full inch at one sitting, demonstrating beyond cavil that it does stimulate the gastric muscle directly, and in a most positive manner. Of this marked retraction each time only a small part persists, but in the pure atonic cases it has been usual to see a permanent gain of from one to two inches as a result of twelve to twenty treatments given from five to eight minutes at a time on alternate days. Some cases treated every day responded even more rapidly, but my experience points to the need of caution in this respect, as in some of my cases there was at the same time rapid lessening of HCl, and, later, after this had gone below the normal, there resulted nausea, loss of appetite, etc., from the further electric treatments, showing over-stimulation and depression of the glandular function.

On the other hand, in two cases of chronic gastritis with deficient secretion and enormous dilatation, similar treatment along with lavage, massage and the administration of HCl internally were followed by an increase in the amount of the secretion, at the same time that the stomach contracted. But in these the gastric mucosa was manifestly less sensitive and could better bear the powerful direct stimulation required to contract the muscular walls. In one of these two cases the increase was temporary and the proportion of HCl declined again during the further treatment; in the other one a small family battery was used at the patient's house, not the stronger apparatus with high tension coil employed in my other cases.

I have not tried the experiment of giving small doses of intragastric electricity to increase the action of the glands, since abdominal massage and hydrochloric acid administered as a remedy are sufficiently effective for this purpose, and much pleasanter, but I do not doubt that faradism applied in this way would prove a safe glandular stimulant.

Fifteen patients in all have received intragastric electricity from me. Twelve of these had enlarged stomachs with more or less muscular insufficiency. One of those residing at a distance has received only two electric treatments at long intervals and no result in this case could yet be expected. In all the remaining eleven there has been a decided reduction in the size of the stomach, with an increase in the motility. In one of these, a case of hypopepsia with aggravated neurasthenia, the intragastric method had to be suspended at the end of a week on account of increasing nausea and anorexia. The various forms of electricity used externally, together with massage, being persevered with produced in this case results as favorable as were obtained in any of the others. The stomachs of several of the eleven are already normal so far as regards their size and motor functions. It will be of interest to add that eleven of the fifteen cases had either a normal or excessive secretion of HCl at the beginning of treatment by intragastric electricity, and that in nine of these a decided lessening of such secretion was noted by the end of two to four weeks. In one only of these eleven cases there was an increase of the HCl. In the eleventh case no opportunity has yet been offered for making a second analysis of the stomach contents.

The form of special excercise prescribed for most of my patients with dilatation of the stomach is the use of sets of the now familiar pulleys with elastic cords. I have found no other exercise, unless it be rowing, so useful in developing the abdominal and trunk muscles generally.

In the following reports one or more have been selected as specimens of each of a class of cases. These include:

1. Cases treated by diet and exercise, with in some instances tonic medication.

2. Those treated by the same methods plus massage.

3. Those treated by diet, exercise and intragastric faradism.

4. Those treated by the foregoing combination of remedial measures in addition to general massage, with sometimes very light effleurage of the abdomen, avoiding all kneading over the stomach. Lavage was added to the treatment in most of the cases in which there was much stagnation or chronic gastric catarrh. The diet has been shaped to suit the various indications present, especially the state of the gastric secretion. Particular care has been exercised to have the patients with atonic stomach walls avoid eating too large meals and to take never more than half a pint of fluid with each meal, including soup, but they have

been allowed, and, except in the worst gastrectasis, urged to drink water often between meals, though never more than one glassful at a time.

The great majority of these enlarged and weakened stomachs by the time they have come under methodical treatment have developed some degree of inflammation of the mucous membrane. One of the familiar types of chronic gastritis has been set up. More often than otherwise, as seen by me, the gastritis has been accompanied by either a normal or excessive secretion of HCl, and it is worthy of note that catarrhal inflammation with much mucus, rapid multiplication of bacteria, especially yeast fungi, and excessive fermentation, proves more difficult to overcome than the other morbid conditions. In other words, I have found it easier to strengthen and contract an atonic, dilated stomach and to relieve an accompanying hyperchlorhydria, when present, than to cure the coexisting gastric catarrh. One reason for this is that patients rarely are willing to continue treatment after they have ceased to suffer much inconvenience, and when both the motor function and the secretion of the gastric juice have been brought to the normal, the remaining catarrh usually produces few symptoms, though a low grade inflammatory process lingers. The patients considering themselves virtually well, abandon treatment and then, even if they do not drift back into their former faulty habits, as they are so prone to do, there is a tendency especially in those past middle age or at any age with poor reparative powers, for the remaining foci of disease to persist and to increase again upon the slightest provocation.

Case 1.—Lady, married, aged 45, has been under my care for the past year on account of chronic gastric and duodenal catarrh, with greatly deficient secretion of HCl and marked dilatation of the stomach, complicated by slight gastroptosis, and also by violent attacks of gastric pain. This case is fully reported in another paper to be read at the present meeting of the ASSOCIATION before the Section on Materia Medica and Therapeutics, but a brief account of it will be of interest in this connection. The patient residing at a distance from the city, in a town where there was no masseuse, and being unable to remain under my immediate care, the treatment was necessarily limited to diet and internal medicines mainly. She was required to eat moderate meals only, never overloading the stomach, and to avoid especially sugar, fried things, nuts, shell fish, except raw oysters, and hot or fresh bread. Her medication comprised HCl and pepsin on account of the marked deficiency of the gastric juice, and during part of the time small doses of nitrate of silver in pill form. She received no massage or intragastric electricity. By the end of a year the lower border of her stomach had retracted fully two inches at the same time that the proportion of HCl and of the ferments had returned to about the normal. Her painful attacks had also ceased to recur.

Case 2.—Unmarried lady, teacher, came under treatment in the autumn of 1897, complaining of chronic indigestion with almost daily vomiting and headaches. This case was referred to me by Dr. Samuel Bolton of Frankford, and is also reported in the paper above mentioned, to be presented before another Section at this meeting of the ASSOCIATION. The salient facts will be very briefly summarized here. Upon beginning treatment there was moderate dilatation as well as chronic gastric catarrh and hypopepsia. The lower border of the stomach was a half inch below the level of the umbilicus and the motility was poor. When she last consulted me, April 9, 1898, her stomach had retracted to within normal limits and the percentage of HCl and of the ferments was fully up to the normal. There had been no vomiting or headache for three months. The treatment had been diet, much the same as in Case 1, and the administration of HCl and pepsin mainly. She had also been taught to wash out her own stomach and had done this every day at first, and latterly two or three times a week.

Case 3.—A gentleman, aged 53, has been under observation off and on for the past four years. When he first consulted me he had some acid gastric catarrh, with occasional transient attacks of catarrh of the small intestine, and constipation. His stomach walls were very atonic and the organ extended to the level of the navel, with weak circulation and neurasthenia. Diet and medication at first accomplished very little except to lessen the catarrh and resulting fermentation. During the past winter systematic autolavage was practiced by him for several weeks on alternate mornings, and by means of this, together with a judicious administration of a pill of extract of belladonna and extract of yerba santa (the latter being an excellent sedative apparently to all the branches of the pneumogastric) varied occasionally by giving full doses of alkalies, the catarrhal process was greatly benefited and the HCl secretion reduced to the normal at the same time that the stomach began to lessen in size. Massage, both abdominal and general, was then added to the treatment and continued almost daily for one month. Later the patient learned to massèe his own abdomen, and has since continued it. His stomach is now (May 15) within normal limits, the lower border being fully two inches above the navel and no splash is obtainable, even after drinking a glass of water. Bowels moved now easily with gr. one-tenth of aloin. Exercise with the pulleys has been practiced though not very regularly.

Case 4.—Unmarried lady, aged 25, came under my care first in Atlantic City in the summer of 1897. History of some obscure stomach trouble for six years and for a year or more past patient has had dull pain and nausea nearly every day, coming on soon after eating with frequent attacks of severe gastralgia, and occasionally marked vertigo. She was plump, well nourished and of good color, in spite of extensive atonic dilatation and very aggravated chronic gastric catarrh. The upper boundary of her stomach was in the normal place while the lower border was three to four inches below the level of the umbilicus as shown by percussion, the splash and the gastrodiaphane. The stomach was never found empty except before breakfast and not always then. There were the usual signs of stagnation and excessive fermentation of food. Microscopic examination showed the stomach mucus to be swarming with yeast fungi. There were occasional attacks of acute intestinal catarrh, which yielded with difficulty, and always violent pelvic pain at the menstrual period. Large and repeated doses of anodynes had been required for the dysmenorrhea and often at other times for the gastralgia. The stomach was washed out and a strict diet was enforced. Intragastric electricity in the form of a mild galvanic current—M.A. 5 to 10, the positive pole inside and negative pole in the form of a large flat electrode placed over the stomach—effected more relief to the gastric pain than any other agency. But the relief was temporary. The stagnation and excessive fermentation in a very largely dilated stomach were clearly the chief causes. Finally lavage was regularly employed and the high tension faradic current in as strong dose as could comfortably be borne, was used on an average every second day for at first ten minutes at a time, but later on, this dose having seemed excessive, the time of each sitting was limited to five minutes. There had never been any free HCl in the stomach since the patient had been under observation, though the T.A. an hour after a test breakfast was usually 50 to 60, representing largely fermentation products. After the intragastric faradism had been continued for several weeks a trace of free HCl once appeared in the gastric contents, but none has ever been found since.

Under this energetic treatment, continued more or less regularly for three months, the stomach walls gradually contracted and now the lower border is just above the level of the umbilicus. There was, however, during the latter part of the time that the intragastric faradism was being used regularly, a loss of digestive power and a return of nausea, vomiting and dizziness, symptoms which had previously troubled her much, but had been greatly relieved by lavage and restricted diet. During the last two months the latter measures have been relied on chiefly, with some help from external electric applications, and the patient, while retaining the gain in the size and motility of the stomach which the intragastric faradism helped to effect, is continuing to make satisfactory progress in other ways. There is no more nausea, less dizziness, and greatly less gastric pain, though there is still some mucus secreted daily in her stomach. A highly nervous temperament has complicated the case, and lack of means to obtain massage treatment has been an unfortunate embarrassment. A retraction of fully three inches in the size of such a seriously dilated stomach is, however, a striking evidence to the power of intragastric faradism in such cases.

Case 5.—Widow; aged 64: resident in a neighboring city; came under treatment Oct. 13, 1897, with complaint of cardiac palpitation and flatulent dyspepsia, dating back a year or more. She had been troubled much longer with constipation and occasional headache. A strong, active, energetic and well nourished woman, weighing 150 pounds, she complained of a painful dragging in the abdomen in walking, especially in going

up-stairs. Examination revealed an exceptionally sound, strong heart of normal size, with normal lungs and liver, and kidneys not displaced, but her stomach was enlarged from the usual level above to three and a half inches below the umbilicus. The usual tests showed only a little motor deficiency, and a small, mixed meal would leave the stomach in four to five hours, yet there was an abnormally loud and large splash after drinking a glass of water, and this together with the sensation of weight and dragging after meals, pointed to the fact that the enormously enlarged stomach was not in a proper tonic condition as to its musculature, or to use the cardiac phraseology, that there was hypertrophy, with some dilatation. The analysis of the stomach contents revealed marked hyperchlorhydria and a large amount of mucus with other signs of chronic acid gastric catarrh.

The treatment at first consisted mainly of remedies to reduce the hyperchlorhydria, and simple, plain diet, as little fermentable as possible, with lavage when she could come to the office, which was only at long intervals. Later she came to the city and began a more systematic treatment. Intragastric faradism was now given on alternate days—sometimes every day—with the result of rapidly contracting the stomach. The action on the glandular function was less favorable than in any of the other cases. When the sittings were daily for five minutes during one week, there was a decided increase in the percentage of free HCl, the only instance in which this resulted, in my experience, in a case of hyperchlorhydria. There was also nausea after the latter treatments. Massage was thereupon ordered instead. This was given vigorously over the body generally, but very lightly over the abdomen—little more than effleurage. Lavage was also given every morning for a while, and later every other morning before breakfast. The hyperchlorhydria was not reduced so readily as usual, requiring a pill of belladonna and yerba santa to be continued for some time before coming under control. The lower border of the stomach now, May 15, is one inch above the level of the umbilicus, when the patient stands after drinking a glass of water. This is a reduction in size of over four inches. The gastritis is also greatly improved. The patient is still under treatment.

Case 6.—Widow; aged 38; has been for years a sufferer from indigestion and neurasthenia, dependent upon acid gastric catarrh, dilatation of the stomach and a right floating kidney. There has been a remarkably relaxed condition of her tissues in all parts of the body, and yet singularly, she is almost the only lady patient seen by me with a marked dilatation of the stomach (or with gastroptosis) who has not had at the same time a displaced uterus. She had been under the professional care of various specialists on account of these ailments. During the past year and a half she has consulted me with more or less regularity. In the winter and spring of 1896-7, she made some little favorable progress as a result of diet, physical culture, massage, occasional lavage, and treatments by galvanism to the spinal and abdominal centers. But she returned to her home in a distant city during the summer, and while there suffered quite a relapse. December 10, 1897, intragastric faradism was begun and given, as a rule, three times a week till April 11, 1898. Massage was continued meanwhile daily, but by an unskilled attendant, and lavage was given two or three times a week. When the intragastric electricity was begun her stomach extended from the normal position above, to three and sometimes four inches below the level of the umbilicus. During the first three months of this treatment there was less improvement than in any of my other cases. The lower border of the stomach was still below the navel; but on persevering another month with all the measures and in addition administering full doses of a compound containing nuclo-albumins and bone marrow, she began to improve more rapidly. Now, the lower boundary of her stomach is one inch above level of the umbilicus, and she is stronger and better than for several years.

The percentage of free HCl, formerly a little excessive, has been lowered somewhat below the normal, but there has been no nausea or other noteworthy disturbance of digestion by the unusually long treatment of intragastric electricity.

There have been conflicting reports from other observers as to the effects of intragastric electricity, both on the muscles and glands of the organ. One denies that contractions of the stomach walls can be produced in this way. My cases, 4, 5 and 6 above reported, are therefore of especial interest taken in connection with the preceding summary of the results in all of the fifteen cases in which I have employed direct electrization of the stomach. They certainly establish beyond further question the fact that the motor function of the stomach can be powerfully stimulated by this means.

As to the effect upon secretion, the results above cited seem to indicate that this probably depends upon the dose and upon the degree of reaction. In the dose of faradism necessary to produce efficient muscular contractions there resulted in all except one of the cases with a normal or excessive percentage of free HCl, a depression of the secretion. In cases of gastrectasia with chronic gastric catarrh and very deficient secretion, it agreed better than in most of the others, and in one of these, not reported here in full, the current from a cheap family faradic battery, with a coil of coarse short wire and not very rapid vibrator, applied through the intragastric electrode, seemed to help materially, along with massage, lavage, etc., in restoring the lost function of the glands, as well as in contracting the seriously dilated stomach. It is probable that the very slowly interrupted faradic current would effect contraction in this way with less risk of over-stimulating the glands, and I shall try this in my next suitable cases.

Too much emphasis can scarcely be placed upon the importance of these comparatively simple and safe methods of curing or ameliorating atonic dilatation of the stomach. Large numbers of persons suffering from this serious condition are permitted to go without any efficient treatment, while others are submitted to the new surgical operation known as gastrorrhaphy or gastroplication, designed to reduce the size of the viscus. This may be necessary in extreme cases, but surely all other practicable means of relief should first be exhausted.

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THE DIAGNOSIS AND TREATMENT OF DISEASES OF THE DUODENUM BY DIRECT METHODS.

Presented to the Section on Practice of Medicine at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June, 7 10, 1898.

BY FENTON B. TURCK, M.D.

CHICAGO.

The use of the gyromele in the diagnosis and treatment of intestinal diseases is now so well known by the profession that it would seem hardly necessary to describe the method, but as more work is being accomplished and new facts learned it is destined to add to our knowledge of the physiology and pathology of the gastro-intestinal tube. The gyromele as made for diagnosis, and treatment of the esophagus, stomach and intestines is modified for each part of the alimentary tube to which it is applicable, and also for the various kinds of uses in both diagnosis and treatment. The gyromele as is well known is composed of three essential parts. The cable with a spiral attached to one end and to the other end is attached an instrument for producing revolutions of the cable and spiral. To the end of the spiral is attached a

sponge or bulb or both as required. The cables are made of different lengths and degrees of flexibility adapted for either the esophagus, stomach or intestine. When used for sounding the esophagus short cables Nos. 1 and 2 of 60 to 70 cm. in length and of 2 degrees of flexibility are used.

The spiral attached to the end is short, ending with a bulb or sponge as the conditions of the case require. Various sized bulbs can be attached as in ordinary esophageal sounds. The principal advantage found in this instrument is that the revolving sponge when it passes into the stomach can be palpated upon the abdominal walls, proving that it has passed the cardiac orifice. It is for this reason that the gyromele with a long cable and spiral 120 cm. (or longer) is of such value in passing through the stomach and pylorus into the intestines that in palpating the revolving sound upon the abdominal walls, we gain positive knowledge in locating the viscera. By aspirating through the tube which covers the cable we can obtain the contents and reach the parts safely under the observation of the palpating hand. The vibrations may often be seen as well as felt and by the introduction of water or air or both reach a confirmation in diagnosis that could not be accomplished by any other way, and further, we are enabled to carry out a line of treatment by direct methods.

Kuhn has recently devised an instrument for sounding the stomach and duodenum, but this is simply a modification of the gyromele. Hemmeter has devised a method of ballooning the stomach and passing a tube along the upper borders of the inflated bag within the stomach. This method I have not had any experience with but it appears to be ingenious and of practical value. In the *Centralblatt for Innere Medicin*, No. 9, 1898 (Turck, Die Prioritat der Sondirung von Osephagus, Magen und Eingeweide mittels der Gyromele, biegsamen Revolversonde), I have given the literature on sounding or intubation of the duodenum.

Method of Introduction.—The cable enclosed in long rubber tube is passed into the stomach in the same manner as in the introduction of the ordinary stomach tube. When the stomach is reached the revolving apparatus is attached to the outer end of the cable, and revolutions are produced. The vibrations of these revolutions are palpated upon the abdominal wall and as the gyromele is pushed along the greater curvature it reaches the pyloric end of the stomach, which may be indicated upon the abdomen by outlining with a pencil. By carefully pushing the instrument further an obstruction may be observed which after a moment's delay will disappear and allow the end bulb to pass through the pylorus into the duodenum or further into the jejunum. In case there is much retching or contraction of the abdominal muscles the end bulb and spiral may be deflected across the antrum pylorica, and reach the lesser curvature instead of passing on through the pylorus. This may be detected by palpating the revolving sound. The instrument may then be slightly withdrawn and under the palpating hand pushed onward again until the pyloric orifice is reached and then pass into the intestine.

Method of withdrawing contents and introduction of air or water into the intestines.—When it is desirable to aspirate fluid from the intestine the upper end of the tube is closed by a rubber cork through which the cable passes and is thus made air-tight. To the side of the rubber tube is attached a small tube, through which the fluid may be aspirated. The contents thus may be used for chemic analysis and microscopic examination. When desired fluid or air or both may be forced into the intestine and by inspection, palpation and percussion location can be confirmed. When water is thus forced into the duodenum another tube can be passed into the stomach. If no fluid is found there then aspirating the fluid back from the intestine through the gyromele will give further positive evidence that the pylorus has been passed.

Treatment.—The gyromele is used in the intestines for similar therapeutic purposes as in the stomach. 1. The massage of the revolving sound produces an effect upon the entire vascular system supplying the intestinal walls. By the reflex action of the vasomotor system of the splanchnic area is stimulated, not only through the massage or rubbing effect but the vibratory effect can be distinctly felt and has been observed experimentally upon dogs, their abdomen exposed, and during laparotomies upon the human subject, in which the changes in the circulation can be distinctly seen. This has been previously reported by the writer and others. 2. Cleaning the mucous membrane by removing the adherent material with the revolving sound and green soap, then washing out this loosened slime (decomposed remnants of food, necrosed and degenerated epithelial cells and other irritating material) originated with the writer and is unquestionably of the greatest value in treatment. 3. The application of antisepsis or other medicaments can be resorted to by topical or direct methods with exact dosage, such as the use of nitrate of silver, formalin, etc. The entire mucous membrane may be coated with bismuth when desired. 4. The use of the gyromele as an electrode is superior to other electrodes because the revolving sponge can be located anywhere over the abdominal wall and the application of electricity can thus be made at will to any desired part, as for instance, in cases of patulous pylorus. The electrode may be inserted at the orifice and the faradic current used, or if indicated it can be passed on into the duodenum for the treatment of atony and vascular disturbances.

It is not possible in all cases to pass it into the duodenum; benign and malignant tumors of the pylorus when complete may obstruct, or severe spasmodic forms of stricture. The value in diagnosis is of similar importance to the esophageal sound in strictures of the cardia. In cases where there is much vomiting and retching which may become so violent as to defeat the attempt at passing the sound, then the examination may be postponed for a day or so, when on another attempt it will be found that the sound may be introduced. The contraindication for the use of the gyromele are the same as those of the stomach tube.

In conclusion I wish to particularly call your attention to the diagnostic as well as curative possibilities of the gyromele in an hitherto unexplored field, and doing away partially with the exposure of our patients to the risks of the exploratory laparotomy, which has become such a fad in the past few years, for all affections of the gastro-duodenal region which do not readily yield to medicinal treatment. By means of it (gyromele) we can with almost certainty diagnose an obstruction at the pyloric orifice or a relaxation of the same; we can enter the duodenum and apply our medicaments as called for; we can obtain the various speci-

means of the contents (food, etc.) for chemical, microscopic as well as macroscopic examinations and determine positively whether or not we are dealing with a pathologic condition of the stomach or of the duodenum.

For want of time the cases will not be presented here but will be published later with a full report.

CHRONIC DIARRHEA ASSOCIATED WITH ACHYLIA GASTRICA.

Presented in the Section on Practice of Medicine at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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Among the causes of diarrhea the different conditions of the stomach that give rise to abnormal intestinal fermentation and irritation are of the utmost importance. For many years a form of diarrhea termed lienteric has been described as being characterized by evacuation of the bowels immediately following each meal, the stools containing considerable undigested food. Sometimes more than one movement follows a meal. The explanation given for this a few years ago was that the food was hurried through the gastro-intestinal tract with such velocity that there was no time allowed for its digestion. While such an explanation is in part true it does not cover the phenomenon properly, nor satisfactorily account for the hurried peristalsis. It was advanced by some that the food eaten for dinner, for instance, was partly passed from the rectum immediately after that meal. It may be readily understood how this hypothesis was necessary to account for the undigested condition of the food in the fecal discharges, but no thought was had of the state of the gastric or intestinal digestive secretions. It was not until the gastric secretions were studied, and somewhat more known of the motor functions of the stomach, that a better light was thrown upon this affection. While it will be readily admitted that only a part, perhaps a minor part, of digestion is carried on in the stomach, yet it will be also confessed that the passage of much unchanged food from the bowels will not be likely to take place if the retention function of the pyloric sphincter is normal, and if concomitantly there exists an active secretion of gastric juice. That this position is quite tenable is well illustrated by the fact that it is very seldom a diarrhea is observed to be lienteric provided the gastric function is correct. There may be, and there often are, cases of more or less persistent diarrhea associated with a good condition of the stomach, but such cases do not usually present the characteristics of lienteria.

When mixed foods are retained long enough in the stomach, and the chemical and mechanical changes incident to digestion in that organ proceed actively, the food is in a fair state of solution and comminution, and will not likely pass through the small intestine without being so changed that separate food elements will for the most part have become unrecognizable. If gastric secretion were normally active, and yet the pylorus were abnormally relaxed and patulous, food might be so hurried into and through the intestines as to appear unchanged in the feces, but such a state does not frequently exist, as the pylorus is exquisitely sensitive to active secretion, and the circular fibers are stimulated reflexly to properly protect the orifice and prevent the stomach emptying itself in undue haste. On the other hand, if the gastric secretions fail and the gastric contents are not digested, whether they remain in the stomach a long or a short time, we have the most apt condition of affairs to give rise to lienteric diarrhea provided intestinal peristalsis is sufficiently hurried to prevent complete intestinal digestion, or provided the succus entericus is diminished or absent.

In the gastric affection named by Einhorn "Achylia Gastrica," there exists a suspension of the secretions of the stomach, in some cases as the result of atrophy of the gastric glandules, in others as the result of a nervous disturbance of secretion. It is probable that all cases of this affection do not arise from glandular atrophy. For some years Stockton has maintained that the disorder often begins, and may continue, as a neurosis, and he has found a special form of ocular refractive error associated with it. In writing upon "Gastric Anacidity" some years ago I also emphasized the suggestion that some cases perhaps commence as a neurosis and may go on to subsequent organic disease and atrophic changes. Be that as it may, when the disease is once established the stomach is practically useless so far as chemical change of the food is concerned. Finely divided, thoroughly masticated carbohydrates may undergo more or less digestion, but albuminoids are not changed. A remarkable absence of fermentation is observed in the stomach in this condition wherein there exists a state of affairs, one would say, should be well calculated to encourage fermentative and putrefactive changes.

As is now well known, but little acetic or butyric acid is ever formed, even when much saccharine, starchy and fatty food is ingested. Even in cases with poor gastric motricity and consequent delay in the passage of the contents into the duodenum, there is yet practically no fermentation. This is the opposite of conditions prevalent in cases of gastrectasia and food stagnation from pyloric stenosis or in atonic dilatation.

It should not be understood from what has just been said that food stagnation is never accompanied in these cases by putrefactive changes, as sometimes no doubt actively toxic substances are developed. However, the point it is desired to emphasize is that symptoms of disturbance of intestinal digestion seem more troublesome and pronounced in cases of achylia gastrica than direct symptoms of the disordered gastric condition.

As to the causes of diarrhea in cases presenting an absence of gastric secretion, they may be various. One of the most important factors is the precipitate manner in which the stomach propels its contents into the intestine in a large proportion of cases. It is sometimes found that the stomach is empty one hour after a full meal. In some of Dr. Stockton's cases complaining of no gastric trouble, but seeking advice on account of persistent diarrhea, this hurried emptying of the stomach was discovered. The chronic inflammation of the gastric mucosa may extend into the intestines and thus give rise to diarrhea from chronic catarrhal enteritis, or the intestine may simply rebel from overtaxation, and by way of self-protection expel its contents at the earliest possible moment, or the diarrhea may be the result of intestinal irritation from unusual toxic substances developed in the bowel. Hemmeter found normal pancre-

atic and hepatic secretions in five cases of achylia associated with diarrhea, and thinks therefore that extension of the inflammatory process from the stomach into the intestine is probably not the cause of the trouble. He mentions Oppler's report of a number of cases of diarrhea dependent upon loss of gastric secretion, and also Biedert's account of his own case, which is a striking illustration of the relation of one affection to the other. The diarrhea differs in different cases. For instance, in some there are invariably several morning evacuations, and after the middle of the forenoon there is no further trouble; while in others the diarrhea is post-prandial, one or more stools occurring soon after each meal; and in a third set of cases there are many evacuations during the day, taking place irregularly and not following any fixed rule. In these cases there is diarrhea every day; but there is yet another class in which looseness of the bowels is periodic, coming on suddenly, lasting a week or two and being succeeded by constipation or in some cases by regular normal daily evacuations for a short period which is followed by another attack of diarrhea. The looseness of the bowels is chronic, as illustrated by a number of our cases having had the trouble for years. In some instances a great deal of intestinal flatulency is complained of and a large quantity of gas is expelled at stool. Pain is not a common symptom in these diarrheas. There may be occasionally some colic, but as a rule it is not at all pronounced. There is usually no elevation of temperature; it is an afebrile condition, the temperature is sometimes below normal. The appetite in some of these cases is voracious, approaching indeed what might at times be dignified by the term bulimia. The character of the stools varies. In few instances is there an abnormal amount of mucus. The discharges are frequent and watery, and contain undigested food, their features being modified by temporary influences. In some cases we have observed constipation. Einhorn says there is no rule, but that either diarrhea or constipation may be present.

In the treatment of this type of intestinal affection a few drugs are in some cases most efficacious. The first and most valuable is hydrochloric acid. It is our custom to give 20 to 30 drops of the dilute acid after meals, and see that the dose is repeated in an hour. This remedy seems a positive necessity for these cases. It is the habit of some clinicians to administer it before meals in large doses, say four to eight c.c. well diluted, in deference to Jaworski's statement that the acid is needed to develop the formation of pepsinogen in the gastric glandules. D. D. Stewart recommends the use of the remedy in this manner. The acid is quickly neutralized and combined in these stomachs. I have repeatedly failed to detect its presence as early as ten minutes after its administration; indeed, after meals it has been necessary to have the patient take good sized doses several times, and then to give him an extra 30 drop dose in my office, five minutes before withdrawing the contents of the stomach in order to find a small amount of the free acid present. Another remedy that has proven useful, and which may be given with the hydrochloric acid, is the tincture of the chlorid of iron. Usually it is not necessary to give large doses, five drops being quite effective. In one case excellent results were obtained by adding two drops to every glass of water that was taken. If small doses fail to control the diarrhea, larger should be tried before the drug is abandoned. Bismuth preparations have not proved of much use in our cases. They may, however, be of service when the intestinal mucous membrane is the seat of considerable irritation and catarrh. When an excess of indican is found in the urine, benzosol, benzonaphthol, ichthyol, ichthalbin, salicylic acid, salol, or other intestinal antiseptics may be administered, though small doses of calomel will usually cause a prompt disappearance of the indican.

As there exists in these cases what D. D. Stewart has so well characterized "a suspension of the gastric secretory function," it is advisable to give pepsin in addition to the hydrochloric acid; indeed, this is one of the few conditions that call for its exhibition. Sometimes small doses of Fowler's solution, according to the old plan, given immediately before meals, seem efficacious. In some cases I have remarked benefit following the use of small doses of a combination of arsenic, gold and the red iodid of mercury. Intragastric faradization has been of signal service in several of our cases; the retentive function of the stomach having been manifestly and promptly improved, probably by the effect of the electricity upon the circular fibers at the pylorus.

DISCUSSION.

Dr. J. M. ANDERS of Philadelphia—It is with pleasure that I listened to this paper dealing with two interesting and important conditions in association. I believe that achylia gastrica occurs most frequently in gastric carcinoma and atrophic catarrh of the stomach and neuroses of the stomach as he has intimated. I also meet with this condition in lienteric diarrhea. I believe lienteric diarrhea is more frequently dependent upon catarrhal states of the intestines than any other factor. To corroborate this view I frequently find more or less mucus in the stools. I was somewhat surprised not to hear that this condition of achylia gastrica has not been found associated with tuberculosis; on the other hand, a number of cases of tuberculosis associated with diarrhea—of lienteric character—have been met with. I believe that in the majority of cases some great underlying condition co-exists, tuberculosis, amyloid degeneration, stomach neuroses, etc., which should not be overlooked in the treatment of this affection. I agree with the treatment as described by Dr. Jones. This is one of the few conditions in which large doses of hydrochloric acid and pepsin are necessary.

An interesting thing from a scientific point of view that I have noticed is that in certain conditions where has been found, by the use of Ewald's test meal, an absence of hydrochloric acid and the gastric ferments in the gastric contents, that in spite of the absence of these associated constituents, there may be perfect intestinal digestion and absorption. I have seen two such cases not long since and also have read an article on this same subject.

Dr. STOCKTON of Buffalo—Dr. Jones has given us a good description of achylia gastrica in association with lienteric diarrhea. In my judgment we should separate these cases into two classes—first, those which are accompanied by intestinal disturbances, and second, those which are not so accompanied. No doubt the advent of diarrhea is an unfortunate factor in patients suffering from achylia gastrica, yet when diarrhea does not exist there is a retention of food. This peculiar symptom of achylia gastrica—diarrhea—does not depend upon one factor alone. It is largely a nervous expression. I mean to say that undoubtedly some cases are associated with atrophy of the gastric mucosa or catarrh; these cases should be recognized. On the other hand, we have cases not associated with either catarrh or atrophy of the gastric mucous membrane. These cases have periodical attacks which lighten up without any apparent cause. I have one patient who has this trouble only when pregnant; I have followed her through three pregnancies; the woman is today as well as she was ten years ago. Another patient of mine always has this diarrhea when at home; as soon as she goes away from her home she is relieved. I believe that we have certain cases of achylia gastrica dependent upon nervous conditions alone; we also have them as the result of atrophy of the gastric mucosa. When this is the case they should not be considered as typical achylia gastrica.

Dr. Elliott P. Joslin of Boston—This paper has been one of interest to me, coming as it does from one so intimately connected with the study of this disease. Dr. Jones has placed a special emphasis on the symptom of diarrhea in achylia gastrica. It is interesting that its opposite—constipation—is perhaps quite as frequent. This is to be expected when dealing with an affection of largely a functional origin. Rosenheim pointed out in his Moscow address, it is the variability of the symptoms at different times in the same individual that stamps the nervous dyspeptic. One of these cases of achylia gastrica with constipation I recently saw with Dr. James J. Putnam. It deserves mention because the patient presented a triad of symptoms which I believe will be found quite commonly in the future. The patient was a tall, spare man of 71, a captain of a coasting vessel. He was never immoderate in the use of food or drink. Four years ago, following what was supposed to be an attack of the grippe, he developed melancholia, and on account of this sought Dr. Putnam's advice. In the course of the examination a complete enteroptosis was discovered. The lower border of the stomach, when distended with air, was at the pubes, while the upper, in the upright position of the patient, was at the umbilicus. The liver and kidneys were correspondingly depressed. But Stiller's sign, "movable tenth rib," was absent. Repeated examinations showed complete absence of free and combined HCl and peptones, thus giving us in addition to the melancholia an enteroptosis, achylia gastrica. Are not the parts of this triad melancholia, enteroptosis and achylia gastrica, simply different expressions of a disturbed mechanism?

In the treatment of this affection I can hardly agree to what has been said as to the use of HCl. My own notion was that if a nurse gave a patient, by mistake, fifteen drops of dilute HCl before a test breakfast, the test for the free HCl in the stomach contents removed one hour later would be of no avail. I am indebted to Prof. Ewald for pointing out to me my error. Some experiments of Prof. Chittenden, recorded in his book, "Digestive Proteolysis," give the explanation. To put the matter in a popular way the albumin in two or three eggs dissolved in a little water, will combine with a pint of .2 per cent. HCl, and the solution when then tested with Günzburg's reagent will fail to show even a trace of free HCl. The few drops of acid which we give a patient are simply a "drop in the bucket," and are combined with albumin and still more with peptones the moment they reach the stomach. It is practically impossible to give the needed amount of HCl in these cases. Pepsine would be an advantage in achylia gastrica if we could give a sufficient amount of acid to insure its action, but we have seen that it is impossible, and consequently pepsine can be of no use save for its mental effect on the patient. If one feels constrained to give a ferment, then give pineapple juice, as that will digest albumin in a neutral, acid or alkalin medium.

What then, shall we do in these cases? The stomach does not digest food, therefore the food must be gotten out of the stomach as soon as possible. Fortunately, nature does this for us as a rule. If she does not there is nux vomica to fall back upon. What next? The food must be given in a state to enter the intestines without further change. Finally, the recent operation of gastrostomy shows that patients can get along without a stomach, but we know they can not get along without food. An abundance of easily assimilable and nutritious food is the key to the successful treatment of achylia gastrica.

Dr. Bridges of Nebraska—In regard to the point made by Dr. Stockton in cases of associated diarrhea in achylia gastrica, one must remember that this condition may be, and frequently is, an independent affection of the intestines. Most authorities give constipation instead of diarrhea as existing in this condition as a rule. Achylia gastrica in most cases leads to a condition of dilatation or a condition of stagnation; we also have in many cases of achylia gastrica vomiting associated with constipation. A condition of catarrh of the duodenum or small intestinal glands giving rise to diarrhea is quite plausible. The frequent taking of certain food gives rise to irritation of the small intestine, with accompanying diarrhea. If some cases depend upon a neurotic condition there is always a possibility of a chance for improvement and possibility even for cure. I am especially interested in this subject, especially after reading the writings of Einhorn where he states that the repeated examination of the stomach contents show an absence of the stomach secretions, and even of the rennet ferment. To me there is no doubt but that there is an atrophy of the gastric follicles.

In regard to the treatment, what I would do in these cases would be to employ gastric faradization before employing medical treatment. In one case I carried out intra-gastric faradization for a period of two months with great improvement in a young girl. This treatment should be carried out two or three times weekly.

Dr. Allen A. Jones, in closing—Dr. Anders has mentioned the dependence of achylia gastrica upon tuberculosis. It has not been our experience to find it associated with pulmonary tuberculosis, but rather in this condition have we found catarrhal gastritis with diminished secretion of gastric juice.

Dr. Joslin has pointed out that the great desideratum in these cases is that the stomach should empty itself very soon after eating; and he also doubts the efficacy of hydrochloric acid in the treatment of the affection. While I agree with him as to the truth of the theoretic reasoning, clinical experience has taught me that these cases feel badly and have diarrhea whenever the stomach empties itself with great haste and whenever they cease taking hydrochloric acid.

HEMOGLOBINURIA AND HEMOGLOBINEMIA. REPORT OF CASES, TWO DEATHS AND FOUR RECOVERIES.

Presented to the Section on Practice of Medicine at the Forty-ninth Annual meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY GEORGE J. HIRTH, M.D.

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MILWAUKEE, WIS.

Hemoglobinuria, which may be a disease *per se*, is also present as a symptom in many other conditions, viz: in various chemical intoxications, a long list of infective processes and also extensive burns; more especially does it occur, as a disease, in paroxysmal hemoglobinuria, syphilis and malaria being the cause. A given predisposition, combined with a sufficient cause, as sudden exposure to cold, strained physical condition and the like, will produce the characteristic lesion which is to be found in the blood, and which consists of the disassociation of the oxy- or carbon-dioxy hemoglobin, the free hemoglobin being taken up by the blood plasma—hemoglobinemia (Virchow). The free hemoglobin produced by the increased hemolysis is eliminated as such, in part, by the kidney (hemoglobinuria), and in part as gall (bile pigment of bilirubin and biliverdin). The stroma of the blood corpuscles having undergone this change are to be found generally in the blood or urine a short time thereafter as *blood shades*.

In consequence of the above, there will be an elevation of temperature, enlarged spleen and liver, more or less icterus, and urine containing a high percentage of hemoglobin with possibly gall pigment and few or no *blood shades*.

The cases which I am to report may be known as group 1, patients A, B, C and D, and group 2, patients E, F and G, and before describing each case a few introductory remarks regarding group 1, as regards pre-existing conditions, will be seen to be pertinent.

Group 1: four men, A, B, C and D, painters, engaged in shellacing large beer vats for several seasons past with seeming impunity, three of whom, while working under about the same conditions, on or about January 26, and working until about seven o'clock, after which they went in seeming good condition to their respective homes, were taken ill: A, late that night, and B, the following day, both making their *exitus* within twenty-four hours after they had concluded their work on the previous day. Patient C recovered after a serious illness of several weeks, having gone through similar prodromal symptoms to those who died. A history and detailed account of symptoms of surviving patient C are as follows:

Patient C, age 26 years, weight 185 pounds, of good

family history, engaged in shellacing for several seasons, suffered in common with deceased patients A and B, at various times during several weeks prior to his illness, with nausea, headache, muscular weakness, prostration, ringing of the ears, mental impressions of exhilaration, and temporary attacks of aberration of the mind, with mental depression and sharp, shooting pains, mostly in the back—*sordes labialis* also quite extensive. On Friday evening, Jan. 28, 1898, after having worked till seven o'clock this same day, this patient consulted me for the above described symptoms, and on the following morning I was called to my office to care for patient, whom I found greatly prostrated, with pulse slightly accelerated, temperature 99.6, respiration decreased, pupils partly dilated, slightly cyanosed condition of the lips and finger tips, cheeks slightly flushed, and physical and psychical conditions of patient much involved. When patient attempted to leave he staggered and fell, there being complete inability to walk other than in a tottering condition. Patient was taken to his home and prescribed for as follows: Pills containing 3 m. of digitalis, 3 m. of strophantus and 1/100 nitro-glycerin; one every three hours, and two tablespoonfuls of lime water every one and one-half hours, placed in a warm bed and surrounded with warm water bottles, and given a cathartic. Several calls were made during the day, and at ten o'clock in the evening patient assumed a comatose condition, countenance became from white to pale livid; respiration deep and labored, 9 per minute, and pulse between 40 and 45; extremities, nose and ears, cold and clammy. On the fourth day I found the liver and spleen much enlarged, the latter being from three to four times its normal size. Cold water was used freely on face and chest, strong, hot coffee was given after thirty minutes, when patient was brought to a semi-conscious condition. He was given a large enema of three quarts of cold water, and a great quantity of putrid fecal matter was passed, and the enema was repeated with same result. Patient remained unconscious and had no account of time for the first four days of his illness. I catheterized and drew off 1½ pints of dark to reddish-brown urine, which, upon examination the following day, contained hemoglobin. Guiaca turpentine test, giving an indigo-blue ring and an absence of blood corpuscles by microscopic examination. I found bile pigment on the third day, and it disappeared on the ninth, a small amount of albumin and a few *blood shades*, and no sugar.

On the second day of the patient's illness, symptoms, circulation and respiration were improved, but the central nervous system became more involved; the skin and conjunctiva became tinged with yellow; complete loss of vision, pupils completely dilated and did not react to the most intense light. Patient was kept in a dark room, eyes washed with a solution of Seyler's tablets and dressed three times daily. At the end of the fourteenth day patient began to see the larger objects in the room, such as sofa, bureau, etc., but could not count fingers at normal distance.

On the eighteenth day an ophthalmoscopic examination was made by Dr. Bartlett, professor of ophthalmology of Milwaukee Medical College, which revealed the fact that the retina was immensely congested, there being about eight to ten times the normal amount of capillaries; pupils did not respond to light, and there was a general congested condition of the eye and its appendages, with a few unaccounted for spots in the retina. At present the vision has improved to a considerable extent, though subnormal.

On the second day patient lost control of his extremities and back, having interrupted ringing of the ears, dizziness and a train of nervous symptoms which I shall omit, and was first able to get out of bed with assistance on the twenty-first day after onset of disease.

Pustular macules significant of chronic pyemia began to appear on the seventh day in great numbers all over the body, but particularly about the face, and from that time on I opened from fifteen to thirty daily, being in full bloom of pustulation; they continued for forty days, at the end of which time a picture was taken and an actual count made, giving 131 macular lesions in one or the other of their characteristic stages, on the face alone. From this time on they began to abate considerably, with return to the normal condition of the blood.

On the twenty-first day of the disease an examination of the blood was made by Dr. Evans, with the following results: Poikilocytosis; failure to form in roulettes. Percentage of hemoglobin, .80. Number of red cells per c.m., 3,072,000. Percentage of normal, 61.44. Corpuscle index, 130. Number of white cells per c.m., 8400. Percentage of normal, 84.

Reported examination of the blood showed an increase to normal constituents until the eleventh week, at which time it was practically normal.

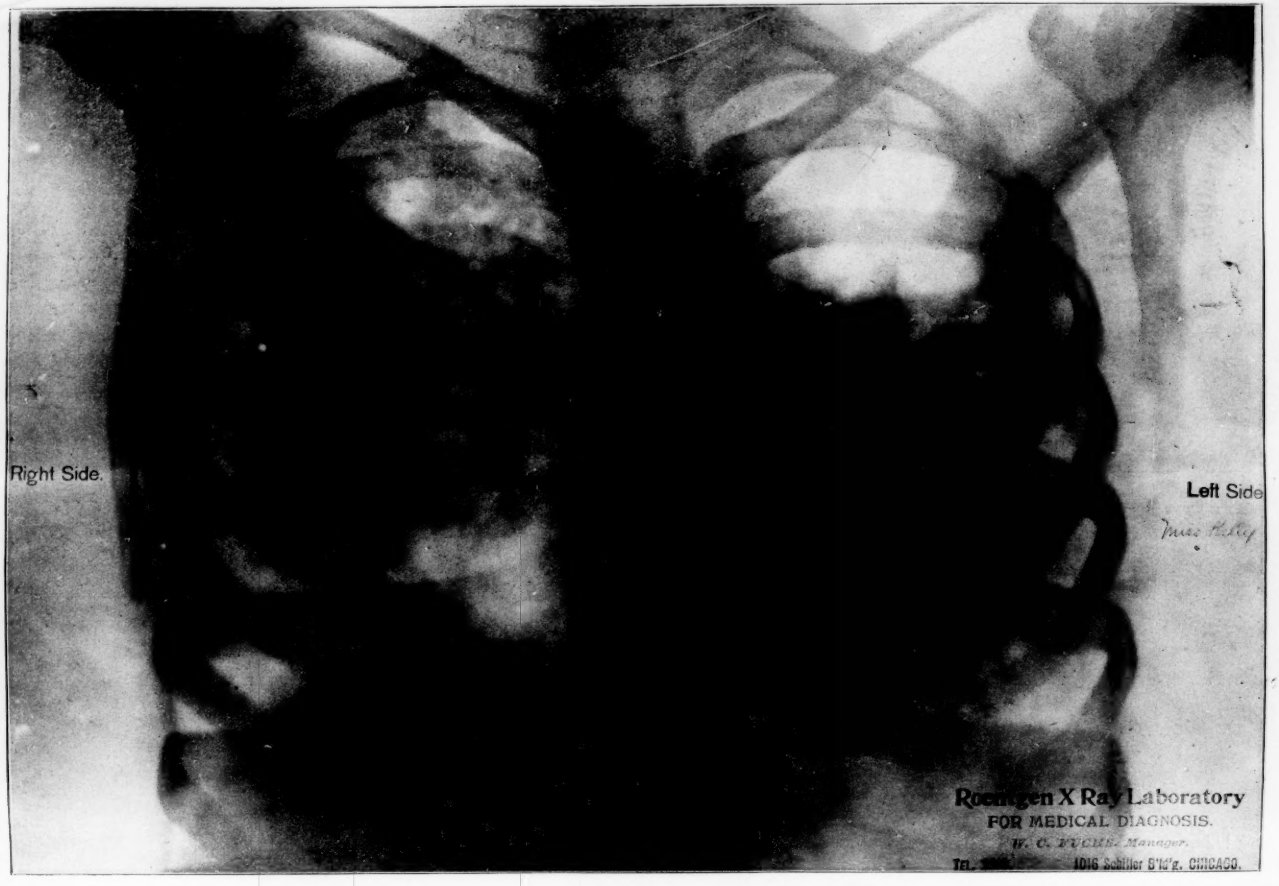
The pathologic findings in the urine disappeared in the following order, viz: hemoglobin was absent on the third day, bile pigment was found last on the ninth day, and the last trace of albumin disappeared on the eleventh day; spleen began to decrease in size on the twelfth day; on the sixth or seventh day the *sordes labialis* began to disappear, and the appearance of a small open sore became manifest on the left side of lower lip, and took on a very rapid growth; blood plasma constantly exuded at this point of lesion, and within fourteen days it appeared to be a typical rapidly-developing epithelioma. I considered it a dangerous factor on account of its very rapid development, and that it was due, doubtless, to the lessened cell-resistance, conjoined with increased cell irritability. Owing to the impoverished condition of the patient's blood I deemed it advisable to operate at once without an anesthetic, which was done by Dr. Earles and myself, at Trinity Hospital, on March 12, being about forty days after the first appearance of the growth. Operation a success. Microscopic findings proved it to be a true epithelioma. The report of Dr. Evans of Columbus Medical Laboratory, on same, is as follows:

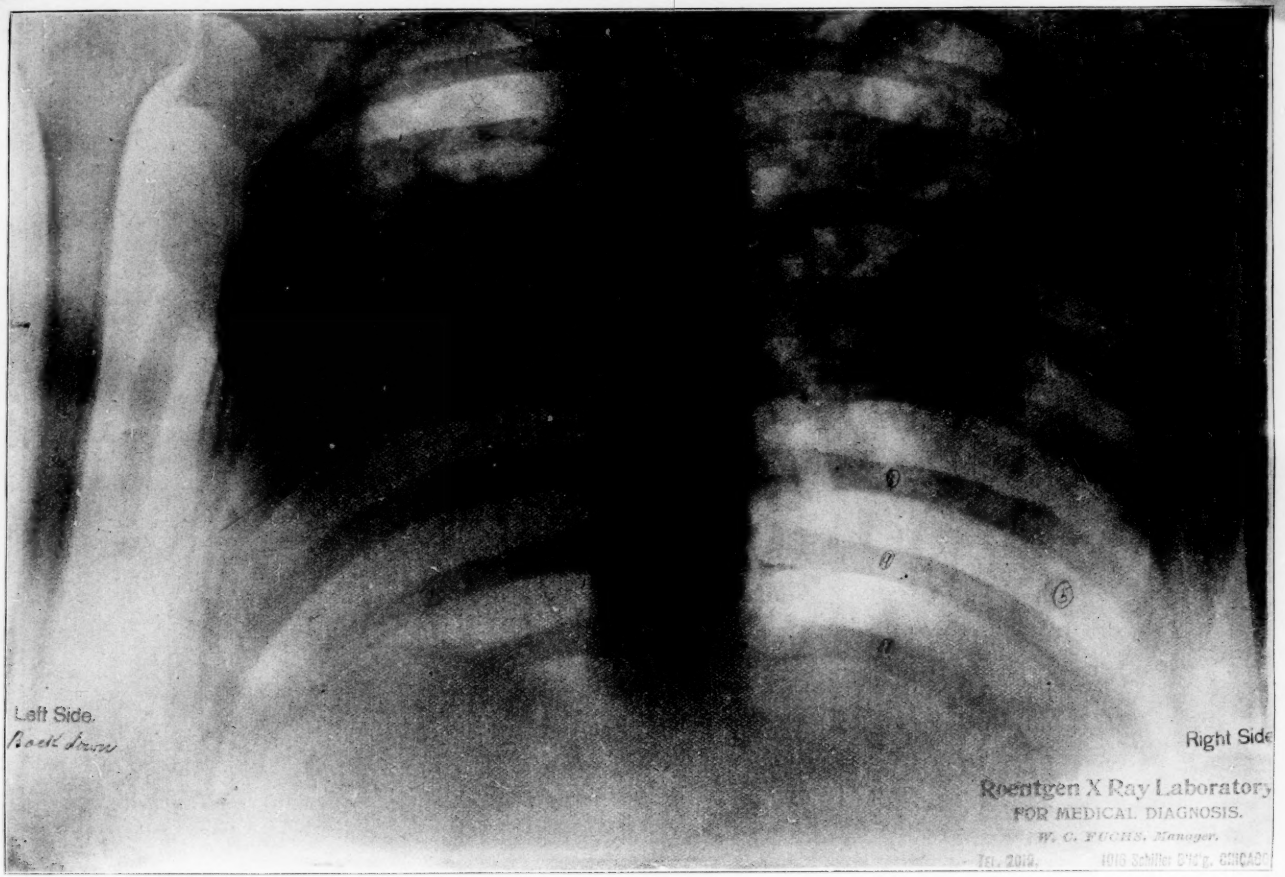
"The specimen is a very pretty illustration of progressing epithelioma. You will never find a better illustration of invasion of underlying tissue than is here shown. There are no pearls or other phenomena indicating any disposition to degeneration. There is considerable ordinary inflammation."

The general tonic treatment of quinin bi-sulphate, alcohol, arsenic, iron, manganese, and faradization and galvanism, from 1 to 1½ milliamperes, to the spine and muscles was continued, and patient from this time on made a very rapid recovery.

Patients A, B and C, were quite temperate, but patient D was addicted to the free use of stronger spirits, and, while having suffered some of the symptoms of the two deceased, and recovered, it may justly be said that he took his daily quota of stronger spir-

RADIOGRAPH No. 5—CASE OF DR. J. B. MURPHY.

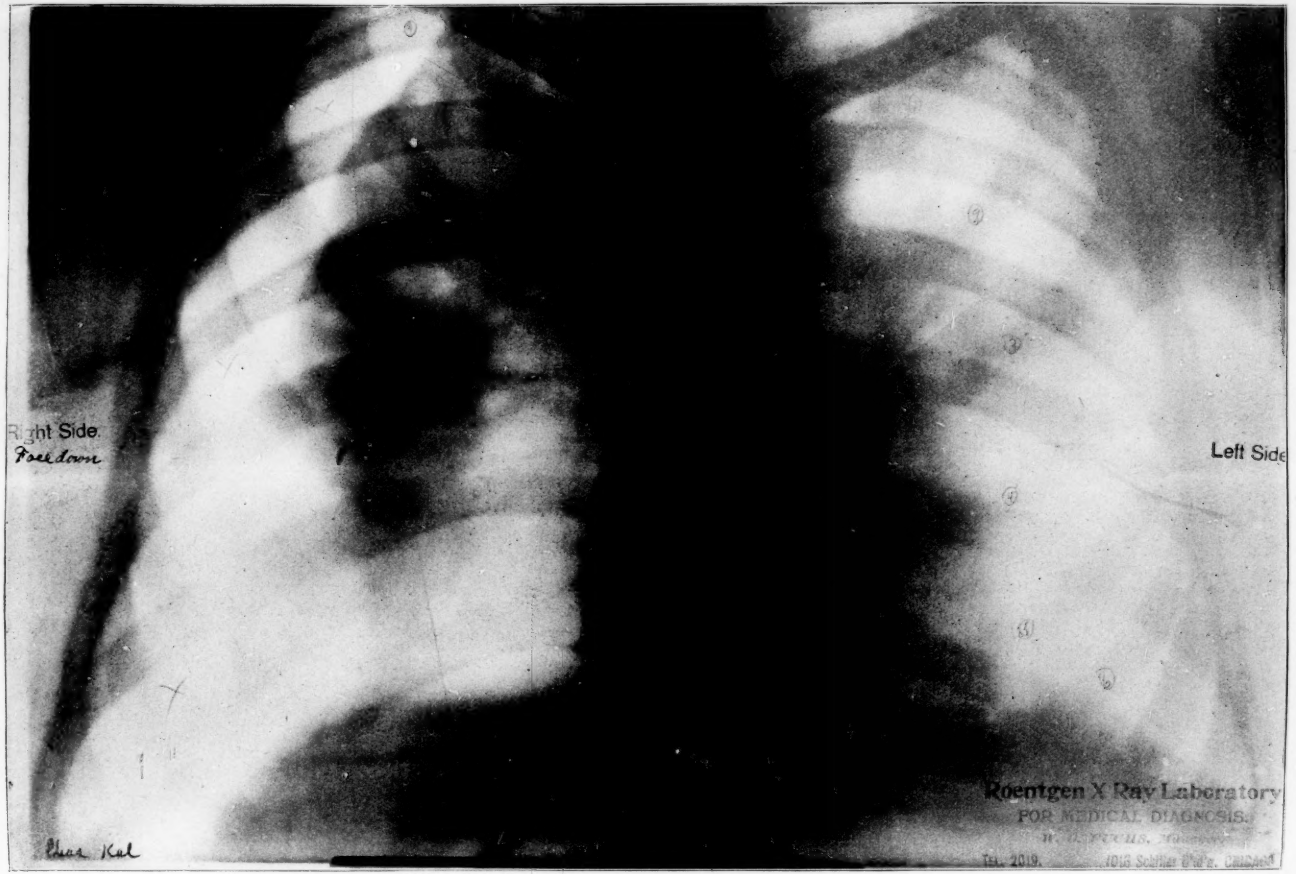




RADIOGRAPH NO. 6—CASE OF DR. J. B. MURPHY.

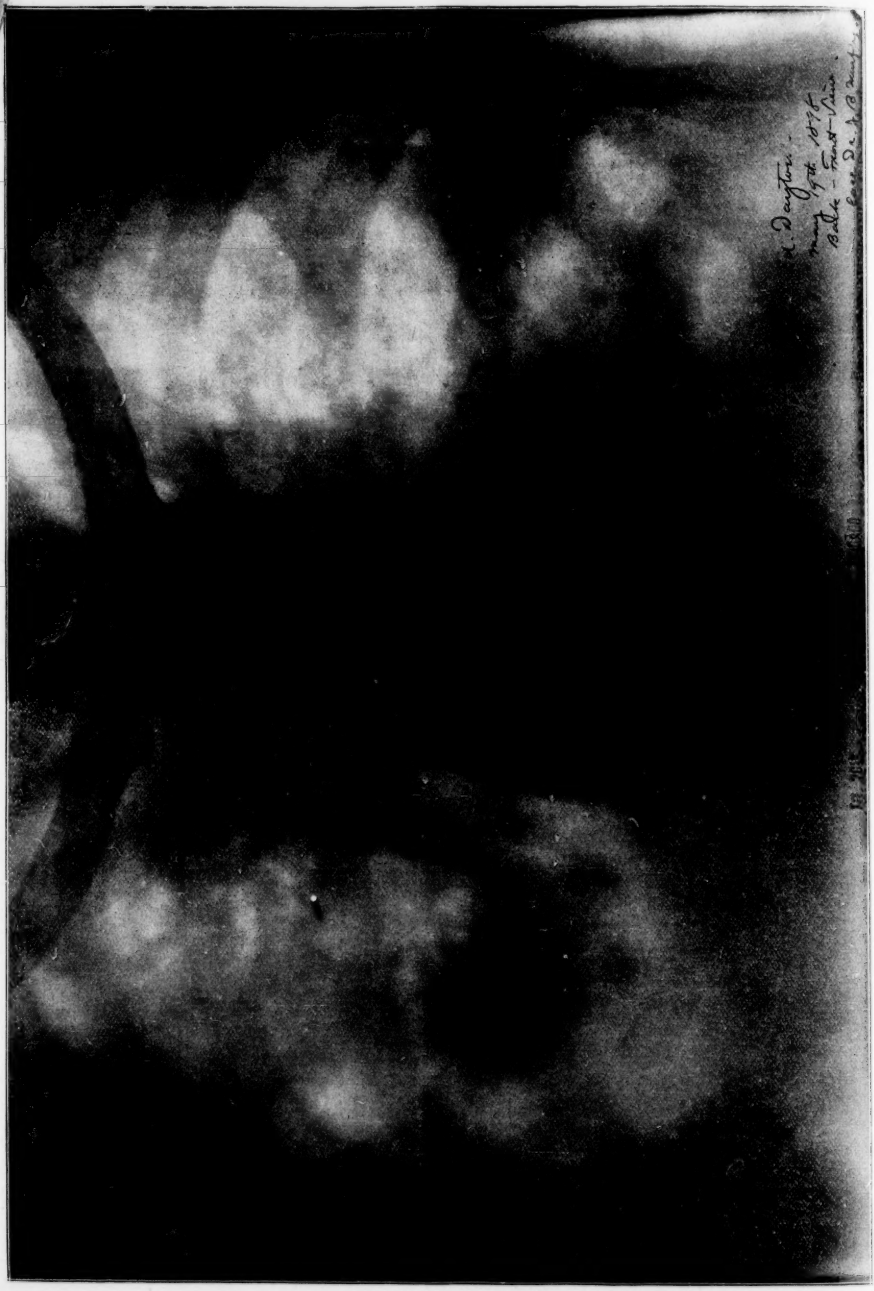
RADIOGRAPH NO. 7—CASE OF DR. J. B. MURPHY.

RADIOGRAPH No. 8—CASE OF DR. J. B. MURPHY.

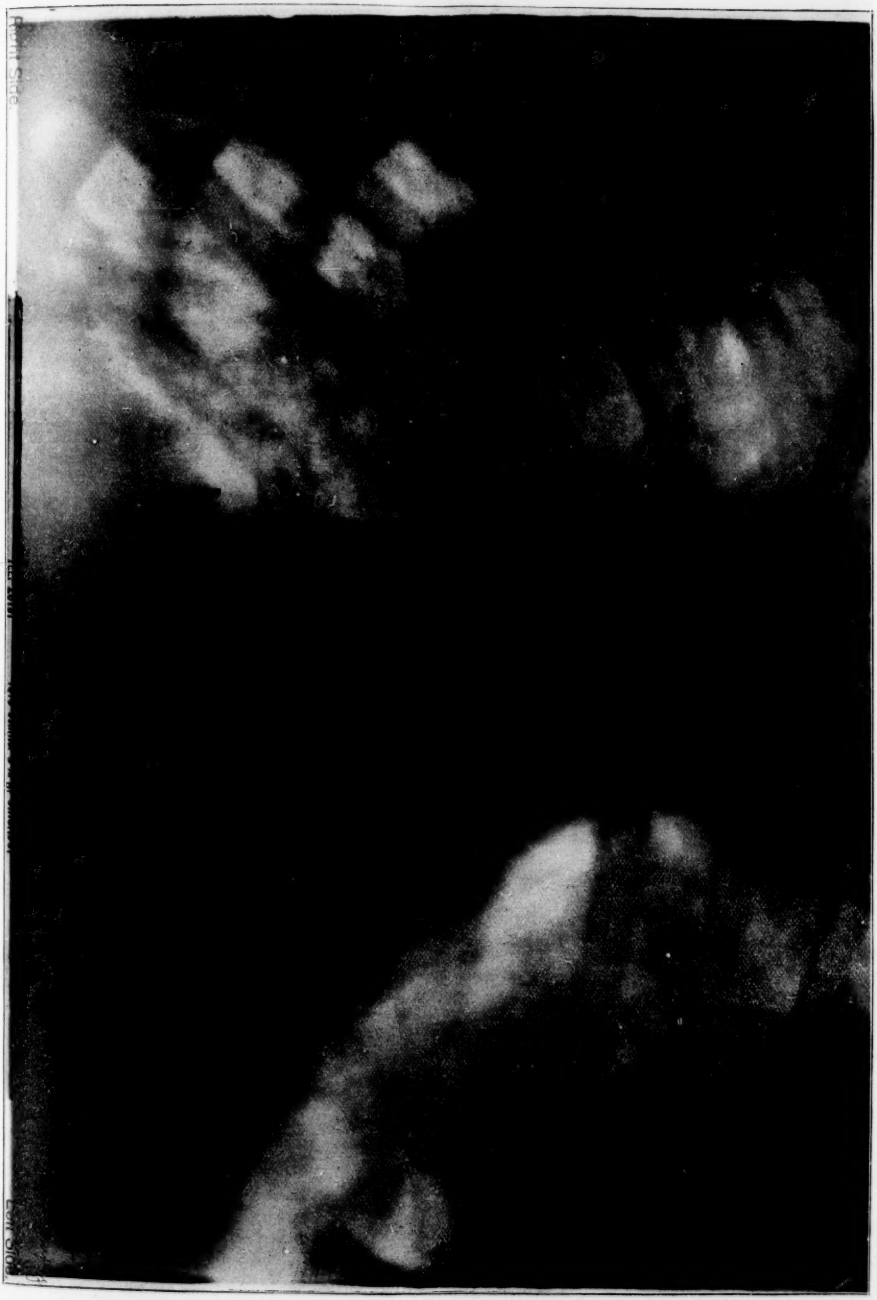


RADIOGRAPH No. 9—CASE OF DR. J. B. MURPHY.

RADIOGRAPH NO. 10—CASE OF DR. J. B. MURPHY.



RADIOGRAPH No. 11—CASE OF DR. J. B. MURPHY.



RADIOGRAPH No. 12—CASE OF DR. J. B. MURPHY.

ten, which fact, we may justly assume, played the partial part of an antitoxin in preserving his health.

The deceased patients, A and B, had identical prodromal symptoms with the one I have just described, other than that the comatosed and unconscious condition was continued and interrupted by convulsions and finally death. The report on record at the Milwaukee City Coroner's office, as regards the pathologic findings of the two who died, shows that all organs were normal, with the exception of slight pleuritic adhesions, and heart slightly hypertrophied with thickened valves in one; in the other case all organs were normal, with the exception of the kidneys, which were possibly congested. In both cases the heart ceased to beat in systole, and blood was fluid throughout the body, and was of a dark color.

That the two who died and the one in the case just cited suffered from one and the same disease, toxic hemoglobinuria, can not be questioned; thus, the only question of interest which remains, as regards cause, is: whence the source of intoxication? The three factors which might have produced the condition were: cold, carbon monoxide, or the impurities present in the wood alcohol which was used for cutting the shellac. A free discussion and investigation of these three cases is to be found in transactions of Wisconsin State Medical Society, 1898, and for reasons given there it is plainly evident that death was caused by the impurities present in the wood alcohol which was used for cutting the shellac. Can there be any doubt that these three patients had gone through recurrent attacks of toxic hemoglobinuria due to the inhalation of the wood alcohol vapors containing, "at times, aldehyde and acetone, the latter often reaching as high as 18 per cent. by weight; but aside from this there are cyanide compounds, notably methyl and ethyl cyanide which are highly toxic."[1] The inhalation of an extraordinary amount of this toxic alcohol produced the climacterium.

Group 2 consists of patients E, F and G. Patient E is a good example of paroxysmal winter hemaglobinuria, and since I have treated patients through a number of attacks a description of an attack may be of interest.

Patient E was a strong man, 30 years of age, good family history, no specific or malarial taint, carpenter, and has been treated by me for eight or nine different attacks during the past five years. Those attacks are characterized by a decided chill, which comes on from five to twelve hours after an exposure to cold, after having been confined in the house for a few days. Chill is of a severe character lasting from one to one and one-half hours, and is accompanied by a temperature of 102 to 103, pain in back radiating to abdominal, inguinal and vesical regions, frequent micturition of dark brown urine, extreme frontal headache and general prostration. The temperature lasts from ten to twelve hours, beginning before the chill, and only abates after the chill and pains have subsided and body is bathed in profuse perspiration.

Urine contains hemoglobin and, in severe attacks, a few blood shades, but I have never found hemoglobin after twelve hours from the onset of the chill. He is able to attend to regular duties within one or two days after an attack, and the paroxysms are best treated when left entirely alone, aside from placing patient in a warm bed. Free use of warm-water bottles and a liberal use of alcohol have been found to cut short the chill.

Upon one occasion before I had made a diagnosis, I resorted to the use of chloroform with the view of cutting short the chill, and it came very near costing the patient his life; the chill became the most severe one I ever experienced, lasting over three hours and terminating in convulsions and final recovery. It may be of interest to note that during the past year patient has become quite addicted to the use of alcohol, and during the past winter has been free from attacks, which, during the previous ten or twelve years, has never occurred.

Patient F (female) is of little interest other than that the hemoglobin was found in the urine until eight days after a severe burn involving the anterior and lateral aspects of left leg above and below the knee.

Hemoglobinemia.—In the last case the patient was a girl 7 years of age, good family history, has just recovered from a severe attack of acute meningitis, and on the seventh and ninth days temperature ranged from 103 to 104½. Blood was extracted according to Küssner's Method, by allowing several leeches to fill on the desired blood, and then the blood was allowed to stand in ice chest for twenty-four hours; the serum was of a ruby-red color and was centrifuged with negative results for corpuscles, but it gave the two absorption bands of hemoglobin, and disappeared upon the addition of ammonium sulphate; by a similar process, other than that the serum was filtered from the blood immediately after removal; the blood upon examination on the ninth day gave same results. The urine was examined on the sixth, eighth and ninth days, with negative results, thus proving that hemoglobinemia may exist without producing hemoglobinuria.

It is authentically stated that hemoglobinemia and hemoglobinuria are frequent complications in severe cases of typhoid, diphtheria and scarlet fever, and I am of the opinion that its presence should be noted as a grave complication and such medicines as favor its production should certainly be withheld, or used with caution. Potassium chlorate, antipyrin and all coal tar derivative febrifuges, etc.

Cause of chronic pyema and pathologic condition of patient C before referred to: As to the cause of the many various symptoms, it can hardly be questioned but that the conditions were due to the increased disintegration of the red corpuscles of the blood, through the agency of the toxic wood alcohol substances before referred to, whereby an autointoxication of the tissues was produced, dependent upon the hemoglobinemia. Howell, "American Textbook of Physiology," says, on page 358: "Intravascular clotting more or less general in occurrence may be produced by injecting into the circulation such substances as leucocytes obtained by maceration of lymph glands, extracts of fibrin ferment, solutions of neucleo albumins of different kinds, etc." The Dorpater School teaches us that the hemoglobin taken up by the blood plasma in cases of hemoglobinemia of any consequence produces toxic action on the white corpuscles, leading to their disintegration and consequent formation of fibrin ferment. May we not also add a third class of corpuscles, the blood platelets, which are even more unstable.

From the foregoing it follows that a chronic autoferment intoxication was produced, and since the clotting of the blood is produced through the interaction

[1] Perry L. Hobbs, Ph.D. Analytic and Consulting Chemist, Cleveland, Ohio.

of the fibrin ferment on fibrinogen, and (fibrinoplastin) there was unquestionably formed fluctulent fibrin coagulæ producing multiple emboli and hemorrhage of the small capillaries, thus producing the chronic pyema, temporary loss of vision, as also were the grave nervous symptoms produced in the same way.

Note on treatment of hemoglobinuria and hemoglobinemia of severe character.—In these cases, internal blood combustion being too rapid, a treatment with heavy oxidizing agents, such as ozone, peroxide of hydrogen and oxygen, would increase metabolism and disintegration of red blood-cells, thereby increasing the production of CO_2 and other effete poisonous products; it is therefore necessary to decrease this metabolism, which can best be done through the agency of reducing agents, the ones most available being calcium hydrate and nitro-glycerin. This also holds good in cases of gas poisoning (hemoglobinuria) which is mainly a CO poisoning. The giving of pure oxygen, ozone, etc., only does harm by adding more fuel to the flame, while the system has alread been poisoned by the effete products of increased metabolism: likewise is the same true in our severe pneumonias, as in either of the two latter conditions.

SOME CONSIDERATIONS OF UREMIA AND ITS TREATMENT.

Presented to the Section on the Practice of Medicine at the Forty-ninth Annual Meeting of the American Medical Association held at Denver, Colo., June 7-10, 1898.

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The numerous and varied symptoms which have been classed under the term uremia have always been an interesting theme for study and speculation. Of the many special theories which have, from time to time, been proposed to account for its phenomena, none have withstood the tests of investigation and criticism. The theory so long ago advanced that the *meteries morbi* is urea was quickly and generally accepted because of the ready proof that in these cases the urea was greatly reduced in the urine and largely increased in the blood and tissues. So firmly did this opinion become fixed in the professional mind that it yet largely prevails, although it has been repeatedly shown that, administered in much larger amounts than are ever found in uremic cases, it is harmless. The fact that experimental and clinical observation teach us that the decrease of urea in the urine gives us a fairly accurate indication as to the imminence of uremic attacks has helped to keep it associated in our minds as the important causal factor in spite of the evidence to the contrary.

The failure to inculpate any one of the chemic substances of the urine, or any one of the pathologic conditions as the essential causal factor, has driven us to the conclusion that many or all of them play some part. "The uremic poison is complex in character, and may vary, not only in the proportion of component elements, but also in the elements themselves," states about the conclusion to which we have come. Repeatedly it has been demonstrated that normal urine is toxic and that its toxicity is diminished in proportion as the kidney becomes impervious. The inference is the retention within the blood and tissues of these toxic materials which the urine has failed to carry away.

As to what these elements are and their properties, we have probably the most satisfactory answer in the investigations of Bouchard, as set forth in his most admirable monograph on "Auto-Intoxication." In the normal urine he has found seven toxic substances. Among these are two which produce convulsions: one inorganic, which he has proven to be potash; another organic, whose exact chemic nature is not established; one which produces coma; a fourth produces ptyalism; a fifth is myotic; a sixth lowers temperature; one (urea) is diuretic. So accurate is the work of Bouchard and so closely do the physiologic actions of these substances correspond to the several prominent symptoms of uremia, that we are justified in assuming that we have in this state a toxemia, or to use the expression of Bouchard, an intoxication; furthermore, that the form which the intoxication will assume will depend upon the substance preponderating in the retained products. If it should be the convulsants, one or both, convulsions ensue; if the narcotic, we have coma. Mydriasis is often present. A lowered temperature is common. Ptyalism is sometimes the most prominent symptom. I have seen one case in which it was the only symptom which excited suspicion of nephritis.

Mrs. F. H. came to my office complaining of excessive salivation. She had been under treatment by a physician for several weeks without any alleviation. She was three months pregnant; stated that the urine was free in quantity, although subsequent measurements showed it reduced; that she had been in good health, except for an illness a year previous, in which the urine had been very scant. Urinalysis showed a specific gravity of 1010, a small quantity of albumin and a variety of casts. Prompt treatment of the nephritis was followed by temporary improvement. A few weeks later an abortion occurred, anuria followed, with development of coma and death. Postmortem examination showed advanced diffuse nephritis.

Bouchard has shown that the narcotic substance in proper proportion has the power of neutralizing the convulsant. In this we may have an explanation of that anomalous fact that so often we have the most advanced impairment of the functions of the kidneys without the development of either convulsions or coma. Anuria not infrequently exists for many days without uremia. Reduced metabolism has never been a fully satisfactory explanation of this fact.

The recent importance attached to fermentative processes in the intestinal canal with the production and absorption of ptomaines has drawn attention to this as one source of intoxication. Bouchard has clearly shown how greatly the toxicity of the urine is increased by intestinal decomposition. It has also been shown that the physiologic secretions, such as the bile and saliva, contain toxic substances and their reabsorption may contribute to the poison. We have therefore four sources for the toxic materials: 1, the products of tissue disintegration; 2, food substances, especially the potash salts; 3, absorbable products of intestinal fermentation; 4, reabsorbed secretions, such as the bile and saliva.

I shall merely refer to another subject in this connection, but one not sufficiently worked out to be dwelt upon in this, which aims to be a brief and practical paper, namely: The functions of the liver in relation to the destruction of these poisonous products.

In view of our present knowledge of this work of the liver it can hardly be questioned that its failure

to properly dispose of the poisonous materials brought to it may be an important factor. Another point to which I shall merely allude, is that the quantity of albumin present is not a reliable measure of the danger of uremic accidents.

For the practical physician the chief value of chemic and physiologic revelations is the indications they give for treatment.

In the treatment of what may be called chronic uremic symptoms, such as headache, dyspnea, nausea, etc., we have involved the treatment of the chronic nephritis. The points I wish to insist upon in this connection are that metabolism shall be reduced by rest, intestinal fermentation guarded against by proper diet, catharsis, and if necessary the occasional use of non-absorbable intestinal antiseptics.

The bacteriologists have shown us that meat and meat products, such as soups and beef tea, are especially good media for bacterial growths, and that they produce the most virulent ptomaines. In meat also we have a source of potash salts; hence the importance of excluding it from the diet of all patients threatened with uremia. In serious cases, a strict milk diet; in the less serious, a milk diet with carbohydrate food is the most satisfactory.

Elimination by the skin is to be maintained, not by the use of drugs, but by baths, hot air, vapor or packs, selected according to the convenience and tolerance of the patient. It will frequently be found that one form is much better borne than another. Minute attention to all the habits of life, clothing, diet, the maintenance of elimination, will often defer for a long time the onset of uremic accidents. The prophylactic value of one drug is not sufficiently appreciated, namely, veratrum viride.

Several years ago an aged patient had several attacks of uremic coma; the pulse was hard and bounding, not only during the attacks, but also between them. Here was evidently an indication for lowering of the blood pressure, for which purpose we have no surer or safer drug than veratrum. In this case its administration in amounts sufficient to materially lower the blood pressure, held the attacks under control until treatment of the nephritis had restored him to health. I have since, a number of times, where uremia was threatened or feared with high blood tension, seen its good effects.

Notwithstanding most of our text-books warn against it, the use of drastic diuretics is too indiscriminate. In acute inflammations the great principle of rest is certainly as applicable for this organ as of others. It should not be stimulated to greater work, but should be as far as possible relieved by calling upon the complementary organs of elimination.

In the treatment of uremic convulsions and uremic coma there prevails a great diversity of practice and of opinion. During the convulsions, the first indication is to save life from the convulsion itself. The convulsion may be controlled by chloroform or by morphin, hypodermically. It is, however, bad practice to continue the administration of chloroform hour after hour, as is sometimes done, because of its destructive effects upon the blood corpuscles and because of its interference with oxidation. The difference in experience and of opinion with reference to the use of morphin is due to lack of discrimination in cases. For the immediate control of an acute attack, it is often most valuable, and usually safe. Its action in locking up secretions and diminishing elimination contraindicates its use in chronic conditions or its repeated use in acute conditions. The great success of veratrum viride in puerperal convulsions has suggested that it may also be useful in the eclampsia of Bright's disease. I have twice used it with success in these cases. In a third case its use controlled temporarily the convulsion, but was followed by great reduction in the quantity of urine and finally coma and death. This, however, was a hopeless case; all other remedies had failed; the chief indication, the high tension of the pulse, was absent. Veratrum acts by lowering the arterial tension, by depressing the motor centers of the cord, and by promoting sweating.

Pilocarpin I mention only to condemn. Its sudorific effects are very often more than offset by the profuse salivary and bronchial secretions, and the patient is drowned in his own fluids. Having twice seen this result, I have abandoned it.

Bleeding, which for so long was abandoned, is again coming into favor. It will probably maintain a permanent place in the treatment of certain cases. At the present time it is especially used when combined with transfusion of normal salt solution. This leads us to the consideration of this newer means of treatment. Sufficient experience has now accumulated to prove its great value in the relief of uremic accidents. When the case is urgent, the saline solution should be given by transfusion into the vein in order to get its immediate effects. When the case admits of an hour or two delay, the solution should be given subcutaneously, since the former method is not without danger, and the latter is equally efficacious. If the blood pressure is low, the preliminary bleeding may be omitted. The reported cases, which are now numerous, show almost invariably prompt improvement. Ultimate recovery, however, depends upon the degree of disease in the kidneys. The immediate effect of the infusion is to dilute the poisonous matters in the blood and thus diminish their effects on the nerve centers. Elimination is enormously increased by the prompt production of profuse diuresis and diaphoresis. We have herein a means of tiding many patients over the emergency, giving them the opportunity to recover, provided the anatomic changes in the kidneys are not already too far advanced.

SOCIETY PROCEEDINGS.

The Medical Society of the State of New Jersey.

One Hundred and Thirty-second Anniversary at Asbury Park, June 28, 1898.

(*Continued from page 185.*)

SECOND DAY.

A paper was read by Dr. WILLIAM PIERSON, third vice-president, on

THE UMBILICAL CORD.

Up to the present day no settled plan of treatment of the cord has been agreed upon. Teachers differ widely, yet this is a subject demanding better consideration. He described the treatment it received in the inferior animals, torn by the struggles of the offspring or bitten off by the mother. The Indians do not sever it until the placenta is expelled. The Japanese tie close to the body and preserve the cord with the family archives until the child arrives at maturity, when he constantly carries it about with him and it is finally buried with him. Non-ligation will do when the cord is crushed, torn, chewed, etc., so that bleeding is not likely to occur. The ligature is safer, as cases have occurred where hemorrhage has come on, with fatal results, even when care had been taken. Usually it is tied as soon as the child cries; this may be well, but be not

too precipitate as we may thus rob the child of needed blood. As no harm is seen from late tying, let the child cry and breathe well for a few minutes, or wait till pulsation ceases. Narrow linen bobbin, sterilized, is best for the ligature. Silk is apt to cut the vessels and cause hemorrhage, catgut is unsuitable as it rots rapidly. The usual length from the body is about two inches. The long stump is urged, to avoid tying the intestines and to leave room for a second tie should hemorrhage occur. The short stump leaves less dead tissue, less fetor: it shrinks and sinks into the depression becoming a scab or crust less liable to be pulled or torn, hence it is better. The dressing is to aid the separation, cause complete cicatrization, lessen risk of sepsis. We must encourage the drying, hence not use grease or wet bandages. Absorbent cotton is now in general use; it prevents contact with the skin and does not prevent rapid drying. Free exposure to the air is well and the application of absorbent antiseptic powder prevents excoriations of the skin, as boric acid powder, or rub the end with a moistened bichlorid tablet; dress daily. He has followed, for the last fifteen years, the plan of stripping the stump so as to get rid of all blood and gelatinous matter, leaving it nearly dry; then it may be left without any dressing and falls off like ripe fruit. Under the moist plan the stump decomposes and sloughs off; this may extend to the umbilicus and an open ulcer follow, with great danger to the child. He had seen several such cases and several died, and it was no doubt due to infection by the umbilical vessels. Next as to the belly-band. Thanks to the efforts of several teachers, the importance of this has been proved a fallacy. The reasons urged for its use were warmth, and to retain the cord dressing. Neither of these is necessary, and to retain the cord dressing a heavy netted band may be used. If no dressing is employed then the net is not needed. The belief that support of the abdominal walls is necessary is also a fallacy. Again it was thought to prevent the occurrence of umbilical hernia. This, too, is not true. The band may prevent an expansion of the walls, compress the contents, and thus produce what we wish to avoid. Many believe they have seen this as a result of tight bandaging. The bandage then should be abandoned. The anomalies, accidents and diseases of the cord deserve more attention. Death of the fetus in the womb is not often determined as to its cause. Still-birth is given as the cause of death, when the cause of the still-birth should be given: 90 per cent., he believed, was induced by trouble with the cord.

In all cases care should be taken to determine the exact condition of the cord so as to be able to say if any anomaly here caused the death. The length of the cord varies from no cord to five feet; usually it is two and a half feet long. The implantation of the cord into the placenta varies; marginal, velamentous where the vessels pass for some distance between the corion and amnion, before entering the placental structure, or the cord may be received in the fold of the amnion. The latter is dangerous to the fetus as the vessels are liable to traumatism and rupture, causing death from shock, asphyxiation or hemorrhage before delivery. Again the jelly of Wharton may be less or greatly increased in quantity; the only danger is from an excess causing the slipping of the ligature and, as it shrinks, hemorrhage. Here, where very excessive, do not tie till the size is reduced by stripping. Torsion, knotting and coiling of the cord are often observed; the latter may produce occlusion of the circulation and death. This occurs most where the cord is very long. Knots are rarely tight, still such may occur. Coiling round a portion of the fetus is of immense importance. It shortens the cord, may produce strangulation of the fetus, may obstruct labor and may cause detachment of the placenta. All these accidents are really beyond the reach of aid, but in delivery, when a part is encircled, draw down the cord, doubly ligate and sever, after which deliver as speedily as possible, to prevent dystocia and death of the fetus. Prolapsus of the cord is important, causing death in very many cases. It is not a very common accident. Here, place it beyond the point of compression by the parts of the child, and accomplish delivery as rapidly as may be commensurate with safety of the mother. The postural position is best to permit the cord falling back to a safer position, but occasionally fatigue to the mother is so great that this must be abandoned. The gum catheter and loop may be employed to replace it and often succeeds, but the manual method is best when possible, but with all care is needed when the membranes are not ruptured to prevent this, as it adds to the trouble. Podalic version gives much better results when the circulation is feeble or has stopped, then delivery of the head with the forceps will give the best results.

Dr. J. C. MCCOY related the conditions in a case of foreign body in the esophagus, where the child had drawn in a small tin whistle; he failed to extract it with the long forceps, dyspnea at first was very great, then the wire was tried. For some reason the trouble appeared much lessened, hence the parents were unwilling to have any operation performed. In the night the dyspnea returned, the child was brought to the hospital, operation performed, and after sixteen days from the removal of the body, the child was well. He condemned the efforts to extract by an instrument as often highly injurious.

Dr. W. B. JOYNSON reported a case of foreign body in the bronchus and the operation of tracheotomy.

MILK AS A CULTURE MEDIUM AND ITS CAPACITY TO SPREAD INFECTIOUS DISEASES

was discussed by Dr. R. C. NEWTON. Recently there has not been a material addition to our knowledge of bacteriology, perhaps because the subject is so difficult. Keer has followed Schwartz in advocating milk of goats in place of that of cows for invalids and delicate children. It is more uniform in quality, the animal selects her food more carefully and avoids much fluid. The animal is immune to tuberculosis, hence its milk does not need boiling. It has been demonstrated in fresh milk that the fat globules are immediately taken up into the blood and build up the cellular tissue. This constituent of cow's milk is destroyed by boiling. Boiling also alters the fluid albuminoid of the milk that it is difficult to dissolve and assimilate it in the alimentary canal. Milk should not be boiled when its nutritive value is required. All writers agree as to the great value of milk as a food. Skim-milk fed to animals gives good results except in lambs, which do not seem to assimilate it. Working horses have been so fed with excellent results. A seemingly unnatural food for milch cows is skim milk, but it has been satisfactorily practiced. The milk is heated to 155 or 160 degrees and rennet is added; while it is thickening, an equal weight of chaff or finely cut straw is mixed in, well stirred; then it stands two hours and the whole mass is left to ferment for forty-eight hours. Thus prepared, it is claimed that a gallon of skim-milk amply replaces four pounds of concentrated grain food. Feeding milk to hogs has been found to cause them to grow, digest well, and produce more uniformly high grade pork. Another writer insists that sweet milk makes the right kind of pork and sour milk is not good for them. The use of milk as an economic food is gradually increasing. Boat crews trained on milk can always outrow those trained on beer; no doubt this applies to race horses, etc. Hygiene of the stable should now be attended to. Study the manners and customs of the cow in her wild state and learn how health may be preserved. Do not keep too large herds under one roof. A number of writers have indorsed the views he offered last year and insist that milk should be fed to children as soon as possible after milking. The milk laboratories are having a struggle to exist, and it is doubtful if they can be kept open. Pasteurization of milk has encountered much opposition. Koplik of New York speaks in no uncertain terms. Most of the germs in milk which are harmful to children are not affected by pasteurization. Gastro-intestinal disturbance follows. Milk poisoning has been seen after administration of pasteurized milk. As to the spread of infectious disease by milk, there are many cases to report. In Philadelphia an epidemic of diphtheria followed the milk route of a man; the dairy was in an unhygienic condition and the sale of the milk was suspended. There were eighty-six cases and twenty-two deaths. Vaccinia in Caldwell appeared and spread rapidly and caused great inconvenience to the dairymen. The cows were isolated and the sale of the milk suspended. The veterinarians who examined the cows claimed that a majority of the lesions were due to what they called "feed boils," little abscesses on the teats and the udders when the cows went out to grass after being kept on grain and dry food during the winter. These boils need investigation, as many do not understand their etiology, etc., and some deny their existence. There is no doubt such a condition in milch cows more or less constantly in the spring.

Experiments to show the effect of infectious germs on the milk glands showed injected cultures of anthrax killed the animals but did not infect the milk. By the injection of pus cultures into the veins, in five to eight hours they were present in the milk. In two women suffering with puerperal septic infection, streptococci were found in the blood but not in the milk. They conclude that infectious germs gain access to the milk by circulating through the glands in the blood stream, and to enter the milk they must pass through the glandular substance through some injury. It is recommended that regular microscopic examinations of milk to detect pus must be made. Milk is to be rejected when over an average of five pus cells are found on the field of a twelfth-inch oil-immersion lens. An extensive epidemic of typhoid fever was traced to a dairy near Paterson. In the study of tuberculosis in milk some advance has been made. Tubercle bacilli do not always develop in

milk but remain alive and virulent for at least two months and a half. One believes it due to overmilking, and urges the law to compel cows to go dry three months after gestation. Authorities differ as to bacilli in butter. One observer examined eighty specimens and did not discover it in a single one. One believes that all tuberculosis in the human race comes from the dairy. Mr. Nathan Straus of New York has no doubt saved thousands of infants' lives by supplying sterilized milk at cheap rates. It is getting to be a fashion to work and write and spend money for the sake of obtaining wholesome germ-free milk. Even of a Tammany brave it is reported, after being appointed a sanitary inspector in New York City, that he expected to make $20,000 by admitting rotten meat, vegetables and fish into the city, but he was going to get up "a h—l of a reputation" by shutting out impure milk. Eternal vigilance is the price of wholesome food products of all sorts. Deaths among children are due to lack of food inspection and food laws; even as high as 35 per cent. Artificially fed children can never be safe from the great white death. Let us never relax our efforts till proper and sufficient dairy laws are enacted and enforced. I have in my investigations discovered a custom so mean, revolting and so devilish that I must speak of it. The sale of bodies of dairy animals which have died of disease or accident to the bologna sausage man. This obtains even in the better class of dairies and would suggest that the dealer in "bob veal" is a philanthropist in comparison with the bologna suasage man. I would urge a law that all milk vendors shall be obliged to take out a license as to the condition of their herds, sworn to, water-supply, feeding, housing, caring for stock, milk handling—the license to be revoked when these matters fall below the standard, or when he shall fail to give notice of sickness among his cattle, his family or employees; the testing of all milch cattle with tuberculin to be compulsory; the selling of cattle which die of disease or accident, etc., to a bologna sausage man to be punishable with fine and imprisonment.

D. J. Leal continued the discussion, considering

MILK AS A CARRIER OF INFECTION.

He said: Time will not allow me to make more than a brief statement of present opinion on the subject. That opinion may be summed up in the following propositions: 1. That milk is a carrier of infection, more so than any other one article of food. The theoretic and scientific basis of this proposition is explained by the discussion on "Milk as a Bacterial Culture-Medium"; its truth is established by a vast mass of evidence which has been accumulated by practical experience. 2. That the diseases, the infection of which is certainly carried by milk, are typhoid fever, cholera, tuberculosis, diphtheria and scarlet fever. This statement, in so far as it relates to scarlet fever, is based upon analogy and practical experience. Milk is also capable of developing and maintaining the vitality and the virulency of certain groups of bacteria, the presence of which give rise to intestinal irritation. Besides, though not proven, it is considered scientifically possible, and practically probable, that the infection of smallpox, typhus fever, tetanus and malaria may be conveyed through this means.

Now as to the common methods of infection of milk by typhoid fever, cholera, tuberculosis, diphtheria and scarlet fever. By diptheria and scarlet fever it is: 1. Through exposure to infected air. This air may have become infected through some patient suffering with one of these diseases, or indirectly through some person or thing thus infected. 2. Through exposure to infection in the handling, directly or indirectly; directly, through handling by some person or persons suffering with these diseases at the time; indirectly, through some person or persons, dishes, containers, apparatus or utensils which have become infected by such person or persons. By tuberculosis it is: 1. Through exposure to infected air, this air containing dust formed in part of dried tubercular sputum. 2. Through direct infection from some person or persons suffering with the disease, as by particles of expectoration flying into exposed milk during an attack of coughing, by handling with infected hands, etc. 3. Through some person or persons, dishes, containers, apparatus or utensils infected directly by some person or persons suffering with the disease, or indirectly by infected dust, etc. 4. Through cows having tuberculosis udders. By typhoid fever and cholera it is: 1. Through the intentional or accidental addition of infected water. 2. Through handling with hands infected by discharges or water. 3. Through dishes, containers, apparatus or utensils infected in handling or by water. 4. In the case of typhoid fever infection through infected ice.

It follows from the above that certain rules must be carefully observed in order to prevent milk from acting as a carrier of infection. 1. That milk for food purposes must be taken only from healthy animals. 2. Every precaution must be taken to prevent exposure to air which by any possibility could be infected. 3. Those handling the milk must not only be personally free from these diseases, but must also be protected from infection through others. 4. All premises, dishes, containers, apparatus and utensils must be guarded from infection through persons, air and dust. 5. All water and ice used in connection with milk must be free from infection. That these rules should be properly carried out is of vital importance to the consumer and of much interest to the profession, the function of which is not only to cure disease but also to prevent it. Unfortunately, however, the producer does not always look at the matter from our standpoint, and is apt to resent, as interference with personal and property rights, our well-meant efforts in this direction. The only solution of the difficulty is the wider dissemination of knowledge upon the subject, and therefore the better education of the people, which must come through the medical profession.

First practical illustration.—In October, 1889, thirty-four cases of typhoid fever were reported to the Board of Health of Paterson. Investigation showed that twenty-seven of these cases were supplied with milk from the same dairy. Further investigation by my friend, Dr. William K. Newton, then State Dairy Commissioner, and myself, disclosed the following facts: Said dairy was situated in an out-lying township. The water-supply was from a spring in the milk house, which was about two hundred yards distant from the other farm buildings and out of the direct line of drainage, and from a well in the barn yard. The well was so situated as to receive the general barn drainage, as well as that of an immense pile of manure placed within fifteen feet of it and in the direct drainage line. Chemic examination of the water-supply showed the water of the spring to be pure and that of the well to be badly contaminated. The dairy people declared that neither the milk, the cans, the dishes nor the utensils came in contact in any way with the water of the well, that the cover full of water which they admitted putting in each can of milk "for the purpose of preserving it," came from the spring, and that cans, etc., were washed with the same water. They denied ever having anything connected with the milk business anywhere about the place except at the milk house, and asserted that water from the well was only used for drinking purposes by the men employed about the barn, and for washing purposes about the house. We also found that on the 14th of the preceding month a stranger from Pennsylvania had been employed about the place. He had complained from the first of not feeling well, suffered from fever, diarrhea, headache, prostration, etc. He held out until the 25th when he was forced to return home. On October 5 another man who had been employed upon the place steadily for two years became ill about the same way and left on the 12th to enter the hospital. Our twenty-seven cases in the city using this milk all developed between October 2 and 24. We succeeded in locating the two employes, one in the Bethlehem, Pa., hospital, the other in the Paterson General Hospital, both suffering with typhoid fever. We also found that both these men while ill on the place had been in the habit of using the manure pile which drained into the well as a convenience. It was easy for us to reach the conclusion that the first man had been a "walking case" of typhoid, that through his use of the manure pile he had infected the well, and that the second man had become infected through drinking the water of said well. The difficulty was to connect the infection with the milk, as according to all the evidence obtainable neither man had anything whatever to do with the milk business. The missing link was found, however, when a female servant confessed that she had been in the habit of washing the can covers with water from the well. The well was filled up on the 16th and no cases developed after the 24th.

Second practical illustration.—The average number of cases of typhoid fever in Paterson during the months of November and December for the six years preceding that of 1896 when we were in the midst of a general epidemic due to an infected public water-supply was, during November 8 cases, and during December, 5 cases. During the first half of November, 1897, 3 cases of typhoid were reported to the Board of Health. From November 15 to Jan. 1, 1898, 142 cases were reported. All of these 142 cases became ill between November 5 and December 15. All but 5 became ill between November 14 and December 15. The number of these cases in well-to-do families was far out of proportion, considering the character of our population. Ninety-nine of them received their milk supply from a certain creamery for all or a portion of the fifteen days preceding the commencement of their illness. Of the 43 cases left, 14 had used cream, or ice-cream, or soda water containing cream from the same creamery, on one or more occasions, between the fifteenth and fifth days preceding their illness. Thus of the 142 cases developing between November 5 and December 15,

only 29 could not be connected wtth the product of said creamery. The natural conclusion to those who have had experience in tracing epidemics due to milk, and understand its difficulties, is that at least a portion of these 29 cases could have been connected if it had been possible to have obtained the facts in every case. Among the handlers of the milk in town or among their families, were 8 cases of the fever. In the Paterson Orphan Asylum, which was the only institution supplied with milk from said creamery, there were 9 cases among the 70 odd inmates. On November 29, I became convinced that everything pointed to the milk as the source of infection, and therefore telegraphed to Dr. Henry Mitchell, Secretary of the State Board of Health, requesting that he have an investigation made of the state of affairs at the suspected creamery. Such investigation was made by Dr. A. C. Hunt, State Inspector, on December 1. During the evening of the same day he reported to me a very suspicious condition of affairs existing there. He had been unable to find any possible source of infection outside of the creamery. At the creamery he had found that water from a brook was pumped into the creamery for general use through a pipe, the intake end of which was from 115 to 139 feet below the privy belonging to the proprietor's residence, which privy overhung said brook. Four or five other privies were situated upon the banks of the same brook within an eighth of a mile. He was also informed that the three sons of the proprietor were ill in the house with remittent fever. He at once ordered the pipe taken out. At Dr. Hunt's request I accompanied him on December 2 for the purpose of making a more thorough inspection. I found the creamery situated upon the bank of a brook. The premises consisted of the creamery, stable, ice-house, cheese house and residence. The privy overhung the brook about 100 feet above the creamery, and was directly in the rear of the cheese house and residence. The water-supply to the creamery was first from the brook through a pipe as described above, which pipe had been removed before my arrival, according to orders given the day before by Dr. Hunt, and second from a spring in the cellar of the cheese house through another pipe. The water-supply of the cheese house was from the spring in the cellar, and the residence was supplied from the same source through a pipe by means of a pump. The house drain, a wooden box, passed through swampy and made ground at a higher level and about fifteen feet above the spring, entering the brook a few feet above the privy. We found that the creamery received the milk of fifty-three dairies, and that said milk was all handled at the creamery and sent to Dover, Morristown, Paterson, Newark, Arlington, Jersey City and New York. Inquiry from physicians, the creamery proprietor and other residents, failed to give any clue to suspicious illness at any of these dairies. I will here state on the authority of the State Dairy Commissioner that all of these dairies were afterward inspected and no source of infection found. The three sons of the creamery proprietor were visited, examined and found to be suffering with typhoid fever. In this diagnosis both Dr. Hunt and the attending physician concurred. Their temperatures varied from 102 to 105 degrees; the typic tongue, irruption and diarrhea were present; they suffered from nose bleed and presented the abdominal symptoms. Not a single important symptom of typhoid was absent except intestinal hemorrhage, and I am informed by Dr. Hunt that two of them afterward suffered from that condition. Dr. Richard N. Connolly of Newark, also produced the Widal reaction in specimens of blood taken from these patients, and isolated the bacillus of Eberth in a specimen of water taken from the cooling vats in the creamery. Taken all in all, considering the arrangement of the premises, the privy, the house drain, the water-supply, the milk handled upon the premises, the presence of the three cases of typhoid, a better illustration for a lecture upon "How our milk supply might become infected by typhoid" I can hardly conceive. There followed a history of the three cases in detail.

I have already stated that milk from this creamery was shipped to Dover, Morristown, Newark, Arlington, Jersey City and New York, as well as to Paterson. I have no information from Dover or Morristown, but am informed by health officials of the other cities as follows: Newark, unknown number of cases among those using milk from said creamery. Arlington, 17 cases and 6 suspected cases, became ill about November 20; all except one used milk from said creamery. Jersey City, 35 cases taken ill November 15 to 20; 24 used milk from said creamery. New York, 9 cases found among those who had used said milk.

Third practical illustration.—A small outbreak in connection with this greater one may possess some interest. A farmer in an adjoining township ran a milk route in Paterson. His supply was from his own cattle. Running short on November 13, 19 and 27 he supplemented his supply with milk from the before mentioned creamery. Between December 1 and 10 his son, living with him, and five of the patrons of his milk route in Paterson developed typhoid fever.

Fourth practical illustration. On Jan. 1, 1898, a milkman, living and doing business in Paterson, became ill. He was supposed to have malarial fever. On January 9 Dr. John C. McCoy was called in and found him suffering with typhoid fever. In the interval between the first and 9th he had continued at his business, personally engaged in bottling and otherwise handling his milk. Dr. McCoy, at his visit on the 9th, at once ordered the patient to bed and thus broke up his connection with the business. Between January 15 and February 1, 27 cases of typhoid fever developed in town; 19 of these cases were supplied with milk by this milkman during that period of his illness between January 1 and 9. The outbreak ceased suddenly here, only four scattering cases developing during the whole month of February, and these having no connection with said milk. One of this series of cases was especially interesting. I personally attended the case and established the facts beyond the shadow of a doubt, the patient himself being a physician and his attendants more than usually intelligent. On the morning of January 2 the Doctor's usual milk supply failing him, the deficiency was supplied from the establishment of said milkman. It was the first and only time that his milk had been obtained at that place. The doctor used said milk upon his oatmeal and drank two glasses of it. On January 15 he became ill with what proved in a few days to be typhoid fever.

There is no other one article of our food supply which is more valuable, which is more capable of harm, and which requires more watchful and constant care. Ignorance and selfishness should not be allowed to stand in the way of our exercise of the right of self-protection. Thousands of lives are lost every year through want of that constant and watchful care. The general public is dependent for its safety in this respect upon the medical profession. That responsibility must be met. We, as an organized profession, should insist that the State throw around this product of such vital importance, every protection which science and experience teach to be effective.

On Wednesday afternoon, Dr. JUDSON DALAND read a paper on

THE METHOD OF ADMINISTERING AND THE USE OF ENTEROCLYSMS.

The only instrumental help is a soft rubber tube, a fountain syringe and a funnel. We must not use anything which will irritate the internal mucous membrane. He preferred a rectal tube with rather thick walls, two feet long and three-eighths of an inch in diameter. Its surface must be as smooth as the finest bougie, the tip slightly tapering, rounded and with a direct opening. Eight inches from the end is a black line encircling the tube. The patient assumes the position and when the lower bowel is emptied by a small enema the soft tube is well oiled and slowly introduced by rotary movement till it passes the sigmoid flexure and enters the colon. The right lateral position is assumed when the cecum and ascending colon are to be irrigated. In an adult, eight inches of the tube must be introduced before entering the colon, as indicated by the black line. Occasionally the tube doubles on itself or is caught by folds of the mucous membrane. This can be overcome by allowing the water to flow from the syringe while being introduced, thus dilating the bowel and smoothing the mucous membrane before it. If much difficulty be found, or pain, it may be from impacted feces, hemorrhoids, tumors of the sigmoid flexure or rectum, etc. Skilful manipulation generally is successful, or we may use the knee-chest position. The raising or lowering of the reservoir will increase or diminish the flow. The liquids employed are water, salt solution, sea water, boric acid, nitrate of silver solution, etc., the temperature between 40 and 105 degrees. The quantity depends upon the age and sex and object desired. A child takes one pint, an adult, two, three or four pints. Ten minutes should be occupied in the work and the liquid be retained that long before being evacuated. An urgent desire is felt at first, but can be overcome by pressure on the anal or peritoneal region and rest in bed. When colicky pains due to gas from too rapid introduction occur, let off the liquid or introduce it slower. If there is abdominal relaxation, bandage beforehand. Use it daily every four hours, or alternate days, according to circumstances. Even if the first effort is not successful, we often succeed by a renewal. It is employed in severe cases of cholera, tannic acid being the medicine used, which was vomited, showing that it had passed the valve. The conditions in which the enteroclysms are indicated, are obstinate constipation, autointoxication, gout, chlorosis, pernicious anemia, conditions indicating an increased supply of water, as a diuretic, diabetic coma,

cholera Asiatica, typhoid fever, cholera morbus, summer diarrhea, enteritis, pseudomembraneous colitis, chronic dysentery, sunstroke, hyperemia, volvulus, invagination.

In the discussion of Dr. Daland's paper, Dr. NEWTON alluded to the use of chlorin water, and the good results of cold water, and in cholera infantum the temperature is readily reduced by the continual use of water per rectum.

Dr. BENJAMIN regarded this method as valuable in typhoid fever. When he found a sudden fall of temperature he generally saw a hemorrhage from the bowel. Then this plan was good. Ice cold water was sure to arrest the hemorrhage. It also proved very useful to produce antisepsis.

Dr. BARKER had for years employed this means, especially in catarrhal jaundice. He employed ice water followed by hot water later in the day. It is sure to bring away the obstruction. He differed as to the length of the tube. It must be long enough to carry well up into the bowel, as the solution is better retained.

Dr. DALAND, in closing, had not mentioned antisepsis, as the washing out makes this less needed and he feared danger from the absorption of the article used. Chlorin was useful, as was a 3 per cent. solution of tannic acid. It inhibited the growth of bacilli; in cholera infantum it was of great value; practically the saturated solution of boric acid is the antiseptic.

Dr. W. B. JOHNSON read an essay on

SCHOOL HYGIENE, WITH REFERENCE TO THE PRODUCTION OF OCULAR DISEASE.

He alluded to the consideration of this subject as early as 1800. The special point in this country is the construction of school buildings; arrangement of rooms, furnishing and lighting, as related to ocular disease, was brought forward by Dr. P. A. Callan of New York. He had concluded after many examinations of school children that the methods of construction were a means of injury to normal vision, as also to the general health and physical development. Improvements in some locations have taken place. The expense is the main cause of the building of schools without the proper arrangements. The movement in behalf of better construction is gaining strength. Scientific facts are not appreciated by the layman. We must get the public to know the great needs of our children in the schools. The most important adjunct is the expensive ventilation. The subject is not studied sufficiently so as to operate the less expensive methods. The window should be used for ventilation and aeration in the absence of the students. The authorities of our State should have regular systematic ocular and physical examinations of our school children. Other States have made vast strides in this direction.

The report by Dr. G. T. WELCH, Chairman of the Sanitary Committee of the Board of Education, shows a preponderance of eye disease, etc., in schools poorly lighted and ventilated over those recently erected, with more direct light, etc. This caused a bill to be presented prohibiting the erection of schools where it is possible for them to be overshadowed by other buildings. It failed to pass and there is now a retrograde action perceptible. Other cities have taken up the matter, and in Paterson a committee has been appointed to confer with the Board of Education to endeavor to have such improvements obtained. Philadelphia and a number of Western cities are working up the matter. New York has instituted the examination of children in public schools with a plan so simple that results are easily obtained. He gave in detail the schedule for the teachers. He alluded to the inspections as practiced in Boston, Chicago, etc., and the valuable results obtained both as to eye troubles and contagious diseases. This will result in placing children with physical defects in separate classes with selected studies such as they will be able to perform, and thus not detract from the proper advancement of those able to do the entire work of the curriculum. We thus may avoid the constant falling by the wayside of so many who are physically unable to perform the work of the usual curriculum. Scientific observers show that the myopic state is the result of ocular application. This is constantly increasing and the time has come when we must prevent its further increase. Recent examinations of volunteers show a very high percentage of rejections, especially of city-bred men. This should impress our citizens of the necessity of action; public institutions must learn that the work intrusted to them must be in accordance with the best known methods. The ideal school house must be built upon a site selected with a view to the possibility of providing adequate light supply for every classroom. This should be direct, not transmitted. The window space must be arranged in relation to the desks, that all light enter from the left and behind the scholars. He then gave details as to scientific construction of the windows, etc., maps, blackboards, etc., to be so placed as not to reflect the light and visible from every part of the room, with a dull surface; the walls etc. to be tinted in light colors, preferably subdued grays or buffs, dead finish, the ceiling lighter than the walls. Ventilation can not be overestimated; the air must be entirely changed once every twenty minutes. The furniture should be of stable character, size proportionate to the pupil who is to occupy it. Desks must be adjustable. Improperly adjusted seats and desks produce many forms of spinal troubles. Specializing the work of teachers requires the changing from room to room of the pupils, making it impossible to occupy the appropriate seats by those who have had them adjusted for them. Teachers might better be moved, but they object, as interfering with the preparation of blackboards, etc. Still, some plan might be obtained to obviate the physical injury to the pupils, even though attended by difficulties to the teachers. Paper and black ink must be used rather than slates or lead pencils. There should be roomy, airy, well ventilated cloakrooms, the toilet arrangements of the most approved style, and constantly guarded lest they are fouled. Any child applying for admission, having reddened or weak eyes, should be at once referred for an examination as to the question of the communicability of its condition, or any developing such condition should be at once sent home with a note and be obliged to present a certificate citing the harmless character of the disease. Physical as well as ocular disease results from faulty light, improper position at work and bad air. Inspection then is demanded daily. Lectures at intervals on subjects pertaining to school hygiene, etc., will be of great value both to teachers and pupils. While it is likely that many will still suffer from the defects of schoolhouses and the want of proper arrangements, yet the belief is that progress now once started will be constant and more rapid, till in the near future we shall see each and every school fully up to the mark, and in every way provided for the physical welfare of all.

Dr. L. F. BISHOP of New York read an essay on

THE CARE OF CHRONIC CARDIAC DISEASE, WITH A CONSIDERATION OF RESULTS.

In the mitral group are included most young people who have acquired a cardiac lesion as a complication of an acute infectious disease, who, while preserving the appearance of good health, still are subject to passive congestion, the so-called cardiac cachexia. This gives them the high color so becoming but so significant of venous stasis. These are less prone to an increase of the cardiac lesion. The aortic type includes, generally, older people, or at least young people who age prematurely, are apt to become anemic, emaciate, develop chronic nephritis, etc. Many will have lesions of both orifices, but will classify themselves under one or the other of these types. There is probably an underlying condition. In a person without a tendency to arterial disease the mitral valve is the more liable to suffer in an acute attack, while where there is a tendency to endocarditis the aortic valve, situated where it is, practically at the beginning of the largest artery, is the seat of inflammation. In the management of chronic heart cases, it is well to bear in mind these two types, because what may benefit one may be prejudicial to the other. The difference is almost the difference between rheumatism and gout; rheumatism representing the mitral cases and gout the aortic cases. It is not necessary to distinguish particularly, from the view of therapeutics, between mitral stenosis and regurgitation. Congestion of the liver undoubtedly has a broader influence upon the whole economy than we are prone to believe, the blood circulated through the liver again and again without being supplied with those elements that favor its healthy metabolism and which seem essential to its proper purification. In addition, the liver has the direct function of producing bile, the natural primitive laxative. The organ is found enlarged and sometimes its functions are interfered with so as to cause complete jaundice. The functions of the liver must be stimulated from time to time by appropriate means, but local applications as to the chest should not be neglected. Congestion of the kidneys is benefited by digitalis, on the circulation, but where there is albuminuria it must be treated as nephritis. Causes of local congestion, whether from displaced or inflamed organs or overloaded viscera, must be treated. Chronic constipation is a foe to these patients; it must be met with diet, training and drugs. It is a vice of indolence; will-power must be induced. Give the fluid extract of cascara in a single large dose at bedtime, instructing the patient to modify the dose nightly, as it secures a free evacuation. At the end of a month the dose may be reduced by drops each night till reduced to five drops. This is continued for its moral effect, to be gradually abandoned. Intermittent catharsis almost always fails. When laxatives must be used, the patient is instructed to

repeat the same process, not to take a single large dose to be followed by diarrhea, but take the drug for a series of days, gradually abandoning it. The evils of constipation are so great that this introduction of the subject is fully justified. The idea of influencing the course of cardiac disease by physical means is no new thing, and yet there is hardly any therapeutic system with so radical a basis that has been as frequently advocated and then discarded or neglected. The reason is not clear, but may be traced to the injudicious claims of over-enthusiastic advocates. The advocates of the Schott system bring forward evidence to prove that there is great improvement under exercise slowly and regularly carried on. The chief effects claimed are a slowing of the pulse and a diminution in the size of the heart. The plan of treatment is not recommended in aneurysm or where there is a high degree of tension, nor is the exercise all of the treatment. The patients also receive baths with mineral constituents, as chlorids of sodium and calcium, at first at a temperature of 92 degrees from six to eight minutes, then the proportion of sodium is lowered and free carbonic acid gas is present in abundant quantities. Climate, with special reference to altitude on cardiac cases, must be studied as to the individual. When the valvular lesion is grave, the patient should remain at a low level. But in cases where the circulation is well carried on, but with persistent murmurs, with the probability that anemia is a strong factor in their production, patients may improve in a high sunny climate. It seems to be agreed that the removal to a high altitude has the immediate effect of increasing the red blood corpuscles. The cause is not well established. I would suggest that the rarefied air brings an amount of oxygen to the lungs in a diminished quantity, thus creating a demand for more corpuscles to gather in the oxygen for the use of the system. Change from an indoor to an outdoor climate is a great deal a matter of volition. The open windows at night and the waking hours spent out of doors, with the adaptation of home life to the system that would be found in places specially resorted to for health, approximate closely in results what is accomplished by health resorts. Too often the means for a change of climate are said to be lacking when the knowledge and moral force are really the elements needed. The influence of the mental health upon the course of cardiac disease is well shown by instances of persons who go on in comparative comfort for many years through the cultivation of even living and quiet thinking. This is especially true of the heart damaged in early life that has placed a limit on the possible activities. These patients who adapt themselves to the inevitable are not made unhappy thereby, but are often rather spared the irritation of the average man who believes that his progress is retarded by his own indolence. In fact, the treatment of heart disease is the treatment of the whole body in each of its divisions. The physician must stand in relation to the patient with chronic heart disease as the captain does to the ship, constantly guiding, and not as the occasional pilot taken aboard when special danger threatens. The physician has the power to save the patient from dangerous conditions, but at each time with a loss of reserve force and with a prospect of a sooner return to the same dangerous condition. Far better is it for the physician to be put in charge before the rocks are encountered and disaster is threatened. It is important to dispel from the mind of the cardiac patient the notion that his chief danger of death is a sudden one. He should be instructed that the probabilities are that if he dies of his heart trouble the death will be gradual, and he should be warned that the first part of the descent from the plane of good general condition marks the danger point. He must be taught to believe that in him disturbances of digestion, loss of color, malnutrition, particularly dyspnea and edema of any kind, should immediately result in an overhauling of his plan of life and system of management.

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"En manos esta el pandero que le sabra bien tener."

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"Captain LEONARD WOOD, Asst. Surgeon, is relieved from duty in this city, Washington, D. C., and will proceed to the following named places in the order designated, for duty in connection with the recruitment of a regiment of mounted riflemen to be organized under Section 7 of the Act of Congress approved April 23, 1898: Guthrie, Oklahoma Ter., Santa Fe, N. M., Phœnix, Arizona Ter., Carson City, Nev., Salt Lake City, Utah, Cheyenne, Wyo., Boise City, Idaho."

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The rapid organization of the "Rough Riders"; the election of Doctor WOOD as colonel; their success in being sent to the front with the first expedition; their bravery and gallantry in action; the epigrammatic advice of Colonel WOOD to his men in the trenches, "Don't swear! fight!"; the promotion of Colonel WOOD to be Brigadier-General, for gallantry on the field of battle—all these events have passed so quickly that it seems almost like a fairy tale.

General WOOD has now succeeded General MCKIBBON as Military Governor of Santiago, and we feel sure that the choice of a medical man for this great and responsible position will result in great good to the country, the army, and the world—the country and the army by the enforcement of sanitary regulations while the troops remain in the vicinity of Santiago, and the world will be benefited by having eventually another healthy port in the tropics.

The sanitary officer can do little unless either clothed with ample power himself, or backed by those in authority. General WOOD being invested with full authority, is now in a position where his sanitary training in the army will make him an ideal sanitary officer, and we fully expect to hear, in time, that Santiago, from being a danger point to the world's commerce, has advanced to the front rank as a salubrious spot.

No other man has ever had such a glorious opportunity, and General WOOD's record, although brief, is such as to give every assurance that this great sanitary work will be performed wisely and well. As the Spaniards say, "the drum is in the hands of one who knows well how to beat it."

NON-COMBATANTS.

When Assistant-Surgeon JOHN BLAIR GIBBS, of the United States Navy, was shot to death by the enemies of his country, to whose hostile fire he was exposed in the performance of his official duty, the word "non-combatant," by which he and others of his class have been almost sneeringly designated, ceased to have the pretense of propriety. When an assistant engineer yielded up his life in the engine-room of the *Maine*, along with the line officer who was likewise at his special station, the quibbler who would continue to dub the former only a staff non-combatant and the latter a military fighting man, would deserve ten-fold the contumely he would have imposed upon a brother soldier. When an assistant naval constructor performed the most heroic act in the existing war and won the admiration of soldiers of prowess all over the world, the bright light of his brilliant achievement brought into pitiable prominence the littleness which would deny him the right and title of a military officer.

It is not at all likely that these will be all the instances by which the staff officers of the Navy will vindicate their claim to be considered *bona fide* combatant officers, and though they have no Victoria Crosses displayed upon their breasts as on their British confères', to bespeak deeds of valor signally conspicuous where all men are valiant, the common sense of the American people and the justice of American legislators will surely recognize that tweedledee and tweedledum are miserable distinctions between men whose bodies are riddled by bullets on the self-same field of battle.

Bracketed between the names of Major ESKRIDGE of the Infantry and Second Lieutenant TURNER of the 6th, one reads among the wounded Dr. DANFORTH, Assistant-Surgeon, instead of First Lieutenant DANFORTH of the Medical Department, a careless oversight, showing how the old opinion of the medical officer as "nothing but a doctor" still lingers. Since in the army tardy but complete recognition of the military equivalence of the medical officer's status and function has been accorded, and when First Lieutenant DANFORTH of the Medical Corps of the army died from the wounds he had received from a Spanish sharp-

repeat the same process, not to take a single large dose to be followed by diarrhea, but take the drug for a series of days, gradually abandoning it. The evils of constipation are so great that this introduction of the subject is fully justified. The idea of influencing the course of cardiac disease by physical means is no new thing, and yet there is hardly any therapeutic system with so radical a basis that has been as frequently advocated and then discarded or neglected. The reason is not clear, but may be traced to the injudicious claims of over-enthusiastic advocates. The advocates of the Schott system bring forward evidence to prove that there is great improvement under exercise slowly and regularly carried on. The chief effects claimed are a slowing of the pulse and a diminution in the size of the heart. The plan of treatment is not recommended in aneurysm or where there is a high degree of tension, nor is the exercise all of the treatment. The patients also receive baths with mineral constituents, as chlorids of sodium and calcium, at first at a temperature of 92 degrees from six to eight minutes, then the proportion of sodium is lowered and free carbonic acid gas is present in abundant quantities. Climate, with special reference to altitude on cardiac cases, must be studied as to the individual. When the valvular lesion is grave, the patient should remain at a low level. But in cases where the circulation is well carried on, but with persistent murmurs, with the probability that anemia is a strong factor in their production, patients may improve in a high sunny climate. It seems to be agreed that the removal to a high altitude has the immediate effect of increasing the red blood corpuscles. The cause is not well established. I would suggest that the rarefied air brings an amount of oxygen to the lungs in a diminished quantity, thus creating a demand for more corpuscles to gather in the oxygen for the use of the system. Change from an indoor to an outdoor climate is a great deal a matter of volition. The open windows at night and the waking hours spent out of doors, with the adaptation of home life to the system that would be found in places specially resorted to for health, approximate closely in results what is accomplished by health resorts. Too often the means for a change of climate are said to be lacking when the knowledge and moral force are really the elements needed. The influence of the mental health upon the course of cardiac disease is well shown by instances of persons who go on in comparative comfort for many years through the cultivation of even living and quiet thinking. This is especially true of the heart damaged in early life that has placed a limit on the possible activities. These patients who adapt themselves to the inevitable are not made unhappy thereby, but are often rather spared the irritation of the average man who believes that his progress is retarded by his own indolence. In fact, the treatment of heart disease is the treatment of the whole body in each of its divisions. The physician must stand in relation to the patient with chronic heart disease as the captain does to the ship, constantly guiding, and not as the occasional pilot taken aboard when special danger threatens. The physician has the power to save the patient from dangerous conditions, but at each time with a loss of reserve force and with a prospect of a sooner return to the same dangerous condition. Far better is it for the physician to be put in charge before the rocks are encountered and disaster is threatened. It is important to dispel from the mind of the cardiac patient the notion that his chief danger of death is a sudden one. He should be instructed that the probabilities are that if he dies of his heart trouble the death will be gradual, and he should be warned that the first part of the descent from the plane of good general condition marks the danger point. He must be taught to believe that in him disturbances of digestion, loss of color, malnutrition, particularly dyspnea and edema of any kind, should immediately result in an overhauling of his plan of life and system of management.

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No other man has ever had such a glorious opportunity, and General WOOD's record, although brief, is such as to give every assurance that this great sanitary work will be performed wisely and well. As the Spaniards say, "the drum is in the hands of one who knows well how to beat it."

NON-COMBATANTS.

When Assistant-Surgeon JOHN BLAIR GIBBS, of the United States Navy, was shot to death by the enemies of his country, to whose hostile fire he was exposed in the performance of his official duty, the word "non-combatant," by which he and others of his class have been almost sneeringly designated, ceased to have the pretense of propriety. When an assistant engineer yielded up his life in the engine-room of the *Maine*, along with the line officer who was likewise at his special station, the quibbler who would continue to dub the former only a staff non-combatant and the latter a military fighting man, would deserve ten-fold the contumely he would have imposed upon a brother soldier. When an assistant naval constructor performed the most heroic act in the existing war and won the admiration of soldiers of prowess all over the world, the bright light of his brilliant achievement brought into pitiable prominence the littleness which would deny him the right and title of a military officer.

It is not at all likely that these will be all the instances by which the staff officers of the Navy will vindicate their claim to be considered *bona fide* combatant officers, and though they have no Victoria Crosses displayed upon their breasts as on their British confères', to bespeak deeds of valor signally conspicuous where all men are valiant, the common sense of the American people and the justice of American legislators will surely recognize that tweedledee and tweedledum are miserable distinctions between men whose bodies are riddled by bullets on the self-same field of battle.

Bracketed between the names of Major ESKRIDGE of the Infantry and Second Lieutenant TURNER of the 6th, one reads among the wounded Dr. DANFORTH, Assistant-Surgeon, instead of First Lieutenant DANFORTH of the Medical Department, a careless oversight, showing how the old opinion of the medical officer as "nothing but a doctor" still lingers. Since in the army tardy but complete recognition of the military equivalence of the medical officer's status and function has been accorded, and when First Lieutenant DANFORTH of the Medical Corps of the army died from the wounds he had received from a Spanish sharp-

shooter while he was in the front in the very act of caring for other wounded, his real brothers in arms, who placed him in a soldier's grave, would be the last to say that he was only a non-combatant.

When WINTHROP CHANLER fell wounded at the attack on Las Tunas, Drs. LUND and ABBOTT carried him into the brush and all three sank up to their necks in the swamp. Dr. LUND, who was formerly a German army surgeon, and who is a giant in strength, managed to extricate himself, stripped off his clothing and swam in the darkness to find the ships. A boat from the *Florida* picked him up and he was taken over to the *Peoria*. As the strange figure clambered up the ladder, the sentry on guard at the gangway challenged him but Dr. LUND brushed past him and strode in his nakedness up to Lieutenant RYAN, gave the customary formal salute, and with the utmost gravity said, "I have come to report that the men over here require assistance." When CHANLER and Dr. ABBOTT were rescued they were still in the water up to their necks. Does it not savor of the ridiculous to call CHANLER a combatant and his heroic life-savers only non-combatants, merely because they were medical men?

The present war makes evident the difference between the military and naval services in this matter of the recognition of the military status of the so-called non-combatant staff. Among the roughest riders of Dr. LEONARD WOOD's Rough Riders—he a Colonel and since a General, every inch of him, albeit a doctor—is Dr. CHURCH, a medical officer, one of Princeton's champion athletes, who wears a sword and carries a revolver, knowing well how to use both, and from the medical colonel down to the cowboy private, not one would intimate that he was only a non-combatant, when he checked his riding and dismounted to succor a wounded comrade of the troop. The shot that enters a man-of-war's boat at the bow, rakes the men pulling at the oars, and lands in the stern-sheets to maim or kill the lieutenant in command or the assistant-surgeon by his side, does its deadly work without regard to which is combatant or non-combatant; nevertheless antiquated tradition and ingrained custom concede to the dead as to the living medical officer only a relative (quasi or simulative) rank, instead of the same military status in the performance of an equally honorable, responsible and patriotic duty, involving precisely the same exposure to danger and the same risk of life.

The practical consequence of this difference in the status of the medical officers of the two services is pointedly illustrated in the instances of the hospital-ships, which the exigencies of the prevailing war have called into existence. The announcements that "yesterday the *Olivette* was made the military hospital-ship of the Fifth Army Corps and put *under the command* of Major A. H. APPEL of the Medical Department of the United States Army;" and that "tomorrow the U. S. Army Hospital-Ship *Relief* will sail *under the command* of Major GEORGE H. TORNEY, Surgeon United States Army," would occasion no remark or question in the Army, but in the Navy the assumed non-combatant character of the medical officer, however high his relative rank, precludes his discretionary control, charge, a technical command, and it is therefore considered essential that a line officer shall be on board as the authoritative superior dignitary. It would not be enough for the commanding medical officer, as in the army, to have a navigating officer under his command to perform the necessary nautical functions of going and coming, of anchoring and getting under way, of heaving to in a cylone or edging off from a lee shore: naval tradition requires that there shall be a line officer, whether Admiral or Ensign, to exercise the prerogative of command, as well over Medical Director as over Acting Assistant-Surgeon. Hence the naval ambulance-ship *Solace*, although the creation of a medical officer and the embodiment of his ideas, is actually commanded by a line officer who directs these medical officers what they shall do or leave undone, nor has the Surgeon-General of the Navy the direction of its movements, as has his Army colleague of the vessels in the military service, which fly the Geneva Cross.

The *Navy Personnel* Bill, which failed to be enacted at the session of the Congress just adjourned, although indorsed and earnestly advocated by the Navy Department, after a remarkably able argument in its favor by former Assistant Secretary ROOSEVELT, proposed to do justice to one branch of the so-called non-combatant staff, by giving its officers actual (that is positive) rank, thus recognizing their equivalent military character; but the bill would have failed to do equal justice to the other staff departments—especially the medical corps—whose *bona fide* military importance has been already so often demonstrated during actual hostilities.

Hence, the medical officers of the Navy have very modestly and respectfully asked that they shall be put on precisely the same footing as medical officers of the Army of corresponding grades and length of service. As Colonel A. of the Medical Department of the United States Army is never by any possibility confounded with Colonel A. of the United States infantry or artillery, and as he never attempts to exercise a colonel's authority over a regiment or a battery or outside of his own department, it is claimed with equal reason that Commander B. of the Medical Corps of the United States Navy will never go on deck to supplant Commander B. of the line in getting up steam or coming to anchor, or in any other way exercise authority outside of the Ship's Hospital or over the men of the Hospital Corps. Just as Major C. of the Medical Department of the Army has had his rank and status defined beyond mistake or question, and his equivalence with all other Majors of Artillery,

Cavalry, Infantry, Engineers, Quartermasters, Commissaries, etc., determined, so does Lieutenant-Commander C. of the Medical Corps of the Navy, ask that he be legally declared to be entitled to all the rights, privileges and immunities of all other Lieutenant-Commanders, be they of the line, engineer, construction, pay or other corps, claiming that his intelligence, naval training and common sense would prevent him from attempting to violate the law by asserting or assuming an authority which his commission does not confer, and for which he would be certainly and properly punished by a court of his own colleagues, should he do so.

Our British cousins have satisfactorily demonstrated their right to military precedence. The London *Lancet* says: "When the medical history of the last war in India is written it will prove interesting reading. There were many difficulties overcome and hardships endured with the usual element of danger," and goes on to relate how, when the medical officers were at work extracting fragments of a missile from the leg of General WOODHOUSE, the Afridis crawled up and suddenly blazed into the hospital tent, sending thirteen shots through the canvas without disturbing the operation, "which went on as if there was no Afridi within a hundred miles." Surgeon-Captain BEYTS and Surgeon-Lieutenant HUGO have added their names to the already long list of medical military heroes in the British Army; and Lieutenant FORD, whose life was saved by the latter, after remaining over three hours with his unconscious wounded patient under a hot fire, will doubtless indignantly deny that a Surgeon-Lieutenant is not every bit the combatant hero that he was himself. The Victoria Cross pinned upon the breasts of such men loses nothing of its value as a distinctly military reward. Rather, the recital of the unparalleled deeds of bravery which have led to its bestowal in these instances, which lacked the maddening stimulus of the charge or the fierce excitement of an engagement, adds luster to the honored roll of its wearers. The percentage of medical officers who have won the Victoria Cross is already so great that its conferment upon another has ceased to be exceptional, and the corps to which these officers belong can no longer be denied an essentially military, therefore, combatant prestige.

What is in a name? A Lieutenant-General ought to be a less resounding title than Major-General, but it is not, and mere General, without any adjectival qualification, outranks all other kinds of Generals. It is the acquired significance of the title which has given each its importance, and military heroes are correspondingly exultant and flattered by their bestowal. *Surgeon*, however, has ceased to be even technically a proper designation for a medical officer either of the Army or Navy, and *Assistant-Surgeon* is an even more objectionable title for a subordinate who does not necessarily assist. So the attempted professional designation of the Colonels and Lieutenant-Colonels of the Army Medical Department, as Assistant Surgeon-General and Deputy Surgeon-General has not been generally acceptable. Lieutenant-Colonel Jones of the Medical Department, U. S. A., Medical Director of the Department of the East; Major Brown of the Medical Department, Senior Medical Officer of the Fifth Army Corps; Captain Smith of the Medical Department, U. S. A., 14th Volunteer Infantry, are explicit and unmistakably distinct as would equally be Captain White of the Medical Corps, U. S. N., Medical Director U. S. Naval Hospital, Norfolk; Commander Green of the Medical Corps, U. S. N., Fleet Medical Officer, Atlantic Station; or Lieutenant-Commander Black of the Medical Corps, U. S. N., Senior Medical Officer U. S. S. *Hawaii*. With equivalent pay and privileges, the matter of line and staff contention would be forever settled, for there would be nothing left for which to contend. The *amour propre* of each department of the service would be satisfied and respected; the special functions of each would be defined; and the service become, as it should be, a brotherhood of men enlisted in the common cause of serving and defending their country.

And it may be pardonable here to state that a greater enemy than armed men and belching cannon is to be combated, and that by medical men alone—the enemy that lurks in the dark and strikes in the back, against whom earth-work and trench and rifle-pit are no protection, but into whose lair the medical officer walks undismayed, though knowing he may be the first of the forlorn hope to fall. No stricken soldier in the field will gainsay the title of *combatant* to the medical comrade who has saved him from death at the hands of this unseen foe.

MALINGERING.

In these enlightened times, when the great public knows well its rights, and knowing dares maintain, it is indeed rare for one of its members to receive an injury that he does not endeavor to make the party or parties whom he deems responsible for his suffering, compensate him for at least the losses he sustains during his forced retirement from his occupation. Such compensation is an act of justice, and in a majority of cases would be readily met by the company or individual responsible. But the injured man is rarely content with simple justice; his friends and his newspapers have warped his judgment and filled his mind with stories of large sums extorted from companies by men not nearly so severely injured as he imagines himself to be. Not infrequently a lawyer belonging to the "shyster" class arrives at his home before he has a chance of having his injuries properly dressed, and excites his cupidity by promising him a good sum in return for his injury, "and it will not cost you a cent contingent fee entirely, my

dear sir." So suit is entered for many thousands of dollars, though happily the plaintiff is often after a few examinations ready to compromise for as many hundreds or less. At this point the most common of the various forms of malingering enters: an aggravation more or less marked of a symptomatology really present. He naturally thinks that the greater the amount of his apparent suffering, the greater the sum of money he will get, and the more readily the responsible party will be inclined to settle without suit. Your true malingerer usually disregards small surgical affections, fractures, dislocations, sprains and the like, and strikes directly at the nervous system, for he seems to know instinctively the difficulty of diagnosticating nervous diseases even among specialists. He then has a local paralysis or a "railway spine," about which he has read so much. The affection fixed upon may be feigned entirely, which is rare, or as mentioned above symptoms really present may be exaggerated. It must not be thought that this latter form is always feigned, and merely for puposes of gain. Surgeons who have attended a number of traumatic cases in which the injured parties have no chance of obtaining compensation, know well that neurasthenic symptoms not infrequently develop, and the victims have no idea but that they are seriously and permanently injured. It is astonishing what large numbers of such cases come to trial, and it is still more surprising with what readiness corporations will compromise even grossly unjust claims rather than submit to a suit, for well they know that the jury is prejudiced in favor of the injured party before a word of testimony has been offered. It is the poor man against the "grinding monopoly," and the average jury will side against the rich corporation every time, regardless of law or justice. Indeed, instances are on record where the judge was compelled to take the case out of the hands of the jury and award the fight to the defendant. That the medical profession is responsible in great part for this deplorable state of affairs cannot be denied and such things will continue until legislation decides the exact status of the so-called "medical expert." The term now is not only one of reproach but of ridicule as well; indeed, it could hardly be otherwise when the patent medicine charlatan, from the mere fact that he is the holder of a diploma, is able to meet the real scientist and deny the latter's statements with an equal chance of being credited.

There are forms of malingering where considerations other than those of a pecuniary nature are at stake, for this is a semblance of disease that involves classes, races and conditions of people, the sexes to an almost equal degree, and as regards age, from the cradle to the grave. The efforts of a child to escape pubishment and the exaggerated complaints of the septuagenarian to excite sympathy and attention are familiar examples. Not common in this country, where there is no compulsion to a military life, but of exceeding frequency abroad where some countries demand service training of all able-bodied males, all sorts of injuries and diseases are feigned to endeavor to evade the sharp eyes of the examining surgeon. Especially is this the case in times of actual fighting, when drafting of men become necessary to recruit the forces in the field; in times of peace, exaggeration of injuries or diseases *said* to have been inflicted or brought on when the claimant was a soldier. "*Said* to have been," for a history of the case may reveal the fact that the injury occurred years before enlistment. This "substitution of origin" (BAILEY), as it is called, plays a most important rôle in the science of malingering.

Probably the most successful of simulators are the poor and vagrant of our great cities, hospital habitues as they are sometimes called. The care and comfort, warmth and good food that the various hospitals and asylums afford, draw large numbers of these people of both sexes to their doors, and expert receiving physicians are often tricked by their artful representations. When in the wards their former experiences stand them in good stead in making themselves out as ill, with the result of obtaining comparative comfort for a few weeks, after which the experiment is tried elsewhere. Almost every physician of hospital experience will recall such cases which have been discharged after a few weeks with the diagnosis of "malingerer." The ailments they will counterfeit embrace the entire range of the science from medicine to the specialties. Their particular trouble largely depends on the particular ward they have occupied during a former stay. Indeed it is not too much to say that they study the symptoms of their immediate neighbors with as lively an interest as the attending physician. Neuralgia and rheumatism, headache, epilepsy, insanity and coma are especial favorites. The obstetrician not infrequently finds cases of phantom tumor. The surgeon encounters cases of simulated tumors and strictures, while simulated blindness and deafness are by no means rare finds for the specialist in those fields. One of the most common attempts in recent days to extract money from a recalcitrant corporation is the attempt to palm off an old hernia as being the result of some recent injury. Some most flagrant attempts of this character have recently fallen under our personal observation.

THE DANGERS OF TINNED FOODS.

From time to time we read in the daily press accounts of poisoning by food products, more particularly by those that are prepared in large quantities and sold in tins or canned packages. Perhaps it is just as frequent, if indeed not more so, for investigation to reveal that the really poisonous effects are due to carelessness in the preparation or in some

defect of the cooking utensils and that there were no canned goods used whatever. But this fact does not do away with a certain prejudice or fear that impels the public to attribute, on the first impulse, all these accidents to the use of these products, though not apparently with the result of very greatly reducing their consumption. Ptomaines, we are aware, may be generated in fresh as well as in preserved meats, and acid can corrode cooking utensils as well as preserving tins, but it is more natural to assume that time and defective preparation in the wholesale establishments are at fault than that the sufferers themselves were in any way responsible. The cheapness and convenience of the canned goods, however, keep them in popular favor, and the temporary loss of confidence in their wholesomeness seems on the whole to have little effect on their sales. It is estimated that in Great Britain alone their consumption amounts to 581,000 pounds daily; a figure that indicates the extent of their demand when one bears in mind that it can be, at best, but a small fraction of the total consumption.

There are, nevertheless, some special dangers in canned foods if they are carelessly or fraudulently prepared, and these have been very well discussed by Dr. BROWN, an English local health officer, in a paper in the *Journal of the Sanitary Institute* for April of this year. The dangers of canned meats are from ptomaines, and these may be developed before canning, after canning, and more than at any other time after opening. The first contingency is probably a rare one, though it is possible that unwholesome meats may be put up and the methods of preparation be insufficient to counteract the growth of ptomaines. In cases of putrefactive changes after canning, the bulging tin is generally a sufficient indication, but there is no security against bacteria after the package has been opened and the contents not immediately disposed of. The age of the contents, other things being equal, is no bar to their wholesomeness; Dr. Brown has tested packages twenty and thirty years old, and except a slight loss of freshness of flavor found them still serviceable.

Canned fruits, on the other hand, are more liable to deteriorate with age; and the dangers in their case are chiefly the absorption of mineral poisons from their receptacles. This goes on at a steadily increasing ratio each year, and freshness is therefore a prime requisite for their perfect wholesomeness. It is probable that many acid canned fruits contain appreciable if not really dangerous quantities of malate of tin and other salts. The quality of the tin and solder used is an important element in the case; Dr. BROWN holds that over 1 per cent. of lead in the tin or over 10 per cent. in the solder should be considered dangerous. In some cases considerable solder escapes into the can from careless soldering, and this is also objectionable. It would be in all respects better if fruit could be put up exclusively in bottles or jars without even metal tops, as regards the question of safety to their consumers.

The cautions Dr. BROWN suggests may be repeated here. They are: Use soon after opening; keep the cans in a cool place, as heat favors fermentation; examine plating of interior of can and distrust corrosion or any bluish slate color as risky; avoid resoldered goods; and do not take the cheapest, as they are likely to be the worst. A valuable reform which he recommends would be to have the date of canning stamped on every package, and this is the most important for canned vegetables and fruits. This is, it is said, compulsory by law in Germany, and it would be well were it so for the home market also.

In spite of all the possibilities of evil, the rarity of trouble from the use of canned goods speaks well for the general honesty of the manufacturers. It is well that it is so since, were it otherwise, a cheap and palatable class of foods would have to be distrusted and often, in common prudence, disused.

WAR NEWS OF THE WEEK.

The war news of the week has not been of an exciting character, although it concerns the progress of an outbreak of yellow fever in an army of twenty thousand susceptible men exposed to the infection, under conditions of fatigue and exposure which would be expected to measurably increase their susceptibility. The first cases of yellow fever appeared July 7, when four cases were taken from a house occupied by our troops at the front. A fifth case was discovered next day in a house in Siboney, directly across the road from the fever hospital established by Dr. GUITÉRAS. The danger of occupying such houses was strongly set forth and widely distributed in a circular from the office of the Chief Surgeon; but this advice was disregarded. The houses, filthy beyond measure, were crowded with soldiers and utilized as offices and storehouses. Shortly after this they were all destroyed by fire under the orders of the commanding general. While Colonel GREENLEAF, chief surgeon on the staff of General MILES, remained at Siboney he telegraphed daily the progress of the disease, but since his embarkation for Porto Rico the information received from the vicinity of Santiago has been meager. The latest information, under date July 23, is to the effect that there are about fifteen hundred patients in the hospitals but that only one hundred and fifty of these are yellow fever cases. Meanwhile the troops have been moved to better camping grounds where a fine breeze usually blows from 9 A.M. until sunset. The atmospheric humidity at the present time is very great, a constant steam or mist rising from the ground. Heavy clouds hang over the hills most of the time, and on the lower grounds early in the day. Rain falls only in the afternoon or night, three or four times a week, and although the showers last but a short time they are so heavy that the poncho and shelter-tent

give little protection. The ground is so porous and its surface configuration so irregular that the heavy rainfall is either absorbed or drained off in a short time.

Such are the conditions before the army medical officers of the Fifth Army Corps at the present time. Whether they will be able to control the disease by prompt isolation of yellow fever cases, and the removal of regiments from infected localities remains to be seen. Up to the time of the surrender they were handicapped by the military necessity which required the troops to occupy certain lines, irrespective of yellow fever infection, and during that time the slow progress made by the disease shows the influence of their restrictive measures. It is to be hoped that they will be able, under the better conditions now existing, to embark the regiments for the United States with a clean bill of health, while the immune volunteers take their place as the garrison of Santiago.

WOUNDS AND DISEASE AT THE FRONT.

Medical officers returned from Cuba with sick and wounded from General SHAFTER'S command have given us interesting details of the medical and surgical work during and after the engagements at Santiago. On the debarkation of troops at Baiquiri they were pushed rapidly forward, each man carrying his blanket roll and three days' rations. Regimental surgeons with their hospital corps men accompanied their respective commands; but all regimental medical and surgical chests, dressings, etc., were of necessity left behind, as no horses or mules had as yet been landed. Surgeons applied to higher authority for their medical property and sent back to Baiquiri to endeavor to recover it; but in the meantime the vessels, emptied of troops, had been ordered out of the harbor and had gone to ports unknown or lay too far out at sea, with no way of communicating with them. Ultimately a launch was procured and some of the regimental medical supplies were gathered up from such of the transports as could be reached. Thus, although the army had embarked with adequate first aid supplies, only a percentage of them was available when the time came for their use. Fortunately, however, the men carried the necessary dressings on their persons, for every soldier of the army, with the exception of the men of one regiment, was provided with the official first aid dressing packet containing two antiseptic compresses of sublimated gauze in oiled paper, one antiseptic bandage of sublimated cambric with a safety pin and one triangular bandage, also with a safety pin. Fortunately also, the arrival of the ambulances from Tampa and of the *Relief*, the hospital ship despatched by the Surgeon-General to meet just such an emergency, put an end to what would otherwise have been a difficult situation.

According to Captain E. L. MUNSON, who was one of the operators at the field hospital, surgical operations were required only in shell wounds. Wounds by the Mauser bullet were apparently either immediately fatal on the field or trivial in their subsequent course. There were no explosive effects from the brass jacketed bullet of the Mauser rifle, the wound of exit in most instances being scarcely larger than that of entrance. Long bones were usually perforated, without comminution, often even without fracture. Only about thirty-five cases required splints. Abdominal wounds were classed among the immediately fatal, as few of them were seen in the hospital. There was little hemorrhage. The Mauser bullet deformed frequently, but even then it did not make the ghastly wounds that were expected. Keyhole wounds made by the bullet when striking with its long axis were fairly common. Many bullets, even when fired at short range, lodged instead of perforating. In eight out of forty-one consecutive cases the bullet was lodged. This was attributed to an inferior or a deteriorated character of the powder in the cartridges supplied to the Spanish infantry. Antiseptic first aid was eminently successful, wounds healing quickly under a scab.

Malarial fevers were infrequent at first but after the rains began to fall they became quite prevalent. A number of cases of typhoid fever and measles occurred, due to infection brought with the troops from the United States. Heat exhaustion and a mild type of sunstroke incapacitated a number of men from duty. Diarrheas and dysentery are rare, a fact attributed to the purity of the water supply. Baiquiri is supplied by a pipe-line from the river of the same name, a pure, limpid stream flowing rapidly over a pebbly bed. The water at Siboney comes from the pipes of the Juragua Iron Company, which run to their wharves near the city of Santiago, following the tracks of the company's railroad for about twelve miles. The hospital is pitched close to this pipe at Siboney and has thus an easily available and unlimited supply of pure water; while at the front the troops obtained water from springs and from the Aguadores, a branch of the San Juan river. Yellow fever is of course the disease in which is centered the interest of the medical officers at the front.

CORRESPONDENCE.

Treatment of Tetanus.

AUSTIN, TEXAS, July 20, 1898.

To the Editor:—I send you report of a case of tetanus treated successfully by the use of antitetanic serum. The diagnosis of the case I believe to have been correct, as shown by the history, the symptoms, the response to each dose of the serum, and, further, that the patient lived ten miles in the country, and was not familiar with the symptoms of tetanus.

A study of this case shows the immediate response to the antitetanic treatment, *i. e.*, the pulse, temperature, pain, stiffness and restlessness were all reduced soon after the injection was given. It can further be seen that the dose of serum should have been repeated sooner in this case; but owing to

the inaccessibility of the patient it could not be done. There were no unfavorable effects from the use of the serum, not even an eruption.

I give the case in detail, as follows: On June 14, I was called to see a case of tetanus, in consultation with Dr. F. A. Maxwell, near Austin, Texas. Minnie T., age 19 years, weight 180 pounds, of robust constitution, on June 6 was in the cow and horse lot and stepped on a rusty nail which entered the fleshy part of the foot for some distance; the nail was removed, there was but little bleeding, turpentin was applied externally and no more notice taken of the foot other than that caused by the attendant soreness usual in such cases, until the afternoon of June 13, when she noticed sharp pains in the wound, running up the leg, especially noticeable when pressure was made over the seat of injury; also pains extending up the spinal column, especially the neck, with a decided stiffness of the jaws and a twitching of the muscles of the arms and legs at times and much nervousness and excitability. Dr. Maxwell had examined the foot, found it tender in the neighborhood of the wound, which had healed, and he made an opening and washed it out with carbolic acid solution and ordered it poulticed to relieve the pain; gave doses of calomel to move the bowels and left potassium bromid to be given every few hours as indicated. The next day I was called in consultation with Dr. Maxwell and found the patient with a pulse of 108, temperature 99.5 degrees, very restless; the pains seemed to run from the foot up the leg and extend on up the spine; there was much stiffness of the jaws; she could, with much difficulty, open the teeth as much as half an inch; peculiar sensations, as she described them, would run up her back and the slightest breeze was sufficient to bring them on. Dr. Maxwell and I dec ded to administer antitetanic serum at once. We thereupon, at 4 P. M., June 14, injected subcutaneously, in the right gluteal region, one-third of a ten c.c. bottle of fresh liquid antitetanic serum (Parke, Davis & Co.), using the regular antitoxin syringe and observing all antiseptic precautions. The patient was seen again at 10 P. M. She had slept from 6 to 9:30, felt well, pulse 90, temperature normal, stiffness greatly reduced in jaws and slight perspiration.

June 15—Seen at 10:30 A. M., pulse 73, temperature normal, no pain; but tenderness in the muscles of the foot, a little stiffness in the jaws; had rested well the night before until 5 A. M.; she was then given potassium bromid and slept quietly until morning.

June 16—Seen in the forenoon, she was a little restless, slept well the night before, condition as on former day, except pulse more frequent (90), temperature normal; at 6 P. M. was more restless, complained of the jaws, soreness in the limbs, pain in the stomach, temperature 99, pulse 96; the second dose of the serum was given, also potassium bromid and chloral hydrate.

June 17—Patient slept well the night before, all the symptoms had improved and the pulse and temperature were normal.

June 18—Found the patient much improved in appearance, temperature 99, pulse 80, cheerful, no nervousness, though complained of tired feeling in the muscles of the jaws when the mouth was opened widely; had been gaping all through the day; could open the mouth widely and had eaten a good dinner.

June 19—Temperature normal, pulse 80, restless until twelve o'clock the night before and then slept well; appetite good; complained of some pain in the foot and leg.

June 20—Temperature 99, pulse 90, rested well the night before but complained of some stiffness in the jaws at times and other symptoms seemed to indicate a recurrence of the attack; she was given, therefore, the last third of the bottle of antitetanic serum; the symptoms gradually disappeared and she made a complete recovery and today shows no evidence of the attack.

Remarks: 1. The serum treatment offers the best chance for life in cases of tetanus; it should not be relied on entirely, however, but other remedies should be used when indicated. 2. The treatment should be used early, preferably as a prophylactic, and the dose should be repeated as soon as any unfavorable symptoms appear. 3. The antitetanic serum should be of the best quality, injected with an antitoxin syringe and under antiseptic precautions.

Yours fraternally,

MATTHEW M. SMITH, M. D.

The Bill was Disallowed.

CHICAGO, ILL., July 20, 1898.

To the Editor:—I wish to call your attention to two cases which will be of interest to the medical profession.

On March 25 I appeared before Judge Kohlsaat with a bill for $25 for professional services against the estate of Byron A. Baldwin. My bill was for administering an anesthetic and assisting at an operation. The surgeon's bill, presented at the same time, was allowed after being cut down. My bill was taken up immediately afterward, when the judge delivered himself, in substance, as follows: Haven't I just allowed one doctor's bill against this estate? When one doctor is paid, they are all paid; I can't have half a dozen doctors coming here making claims against this estate. If you are entitled to anything you must look to the other doctor for it. The bill is not allowed.

The following is from the Chicago *Record* of July 12, 1898: "WINE BILLS ORDERED PAID.—The club dues and wine bills of John Borden Ketcham, over whose estate there was much litigation after his death last fall, were ordered paid by Judge Kohlsaat yesterday. Among the claimants who appeared with unsatisfied bills were the Washington Park Club, $31; the Chicago Club, $53; the Gardiner Commission Company, $178, and the Bodega Wine Company, $25."

From this, one is justified in inferring that the judge thinks it scarcely necessary that doctor bills should be paid, or that a man is not entitled to the services of more than one doctor at a time; and that wine bills are sacred, and that a man may patronize as many liquor dealers as he chooses. If the judge's ruling in this case is in accordance with the law, it behooves doctors to collect in advance for all consultations and for surgical operations, where more than one doctor is always required. But then the judge's office-boy knows that this is not law, but caprice.

Yours truly, D. H. GALLOWAY, M.D.

200 Oakwood Boulevard.

Inebriates In the Army.

HARTFORD, CONN., July 20, 1898.

To the Editor:—I have received two very urgent letters for my opinion on what is asserted to be facts in relation to the appointment of several persons to very responsible positions in the army. It is said that these persons are moderate and periodic drinkers of spirits, who are frequently intoxicated, and I am requested to write an opinion of such persons and their disabilities for such service. I can not say anything of the individual cases mentioned, but the same business principles should prevail here as in civil life. The moderate or periodic drinker is not considered a safe man in positions of responsibility, no matter what his capacity may be otherwise. In the early days of the Civil War, a number of inebriates were in responsible positions on both sides, and some way sad disaster followed their bad judgment. In those days the delusion prevailed that alcohol was a real stimulant and tonic, and in times of great strain a valuable help. Some most bitter experiences disproved this, and the last years of the struggle found nearly all the leading officers in command total abstainers, at least those in active duty on the battle-field. The moderate drinkers, and the men who drank to give them force and

strength for great emergencies disappeared. They were put aside as dangerous men to depend upon. The facts are established beyond question, that no brain-worker can use alcohol to advantage in times of excitement and mental strain, and no inebriate is competent for emergencies of any kind. These facts are the result of constantly increasing experience in business circles, and their recognition is more and more prominent in every field of activity. An inebriate officer in the army is a very dangerous man, more so than an inebriate engineer on an express train. Talent and capacity is of little value compared with a clear brain and steady nerve. While it is possible that inebriates may secure responsible places in the army, it is almost absolutely certain that their disability will be recognized, and in times of great peril they will be found in subordinate places. A very capable officer was suddenly detached from active duty in the Civil War and placed in an unimportant position. He died with the impression that it was the jealousy of the commander that put him aside at this time, and wrote bitterly of this and other events. In reality he was an inebriate, who a short time before this event was widely delirious on the battle field. His superior officer was afraid to trust him, and the real reason was never mentioned. Service on the field and in the camp always sifts out the strong, capable men, and no officer can hope for promotion or eminence, who depends on alcohol for aid in the hour of trial. There was in all probability no better army than the one dissolved in 1865 at the close of the Civil War. The army of today is commanded very largely by the veterans of 1865, and it is safe to say that few, if any, alcoholic incapables will ever occupy responsible situations, at least very long. Such men may be in the service, but their incapacity will certainly find them out.

T. D. CROTHERS, M.D.

Human Serum in Yellow Fever.

ATLANTA, GA.

To the Editor:—During the Yellow fever epidemic of 1897, while regretting that Sanarelli had not been able to put out his serum for the treatment of this disease, the thought occurred to me that the blood of a person having had the disease should answer all the purposes as well as the serum prepared by the tedious process through animals. It would be a simple matter to take blood from the vein of an immune, preferably one recently recovered from the disease, and immediately inject it into the patient affected or one to be protected. It would certainly be as safe as to use serum prepared through animals, which is bottled and kept some time before using, and I believe, would be fully as effective.

I made this suggestion to the Boards of Health of New Orleans, Mobile and Montgomery, but it was late in the epidemic and if it was tried I have not heard of it. A few days ago I wrote to Surgeon-General Sternberg suggesting that it be tried among our soldiers now exposed to such great danger from yellow fever in Cuba.

The success attained in the serum treatment of diphtheria certainly warrants hope for like results in other microbic diseases, and the method here suggested is applicable to them all.

C. C. STOCKARD, M.D.

Precocious Pregnancy.

PHILADELPHIA, July 19, 1898.

To the Editor:—In reference to your article of July 2, 1898, page 42, I recall a case in 1867 (of which I have notes) of the delivery of a girl ten days before she was twelve years of age. The confinement was normal, but was followed by a phlegmasia alba dolens in both legs. She had been brought up in a house of prostitution, and at the age of eight years had commenced cohabitation with boys. She menstruated at ten, and at the time of delivery, pelvis, mammæ and pubic hair were well developed.

I was able afterward to confirm her statement. Her subsequent course was somewhat peculiar. After ten years of the most vicious profligacy she married a staid, quiet farmer, settled down to a life of intensely hard work, and after a number of syphilitic abortions, was so far cured that she raised a family of several children. Very truly yours,

DE F. W.

Malaria Is Not a Disease.

NEW YORK, July 25, 1898.

To the Editor:—I note that in your items for your issue of the 16th inst. Dr. Koch is represented as speaking of "tropical malaria" as if the cause and effect were the same. That is to say, if my view is correct, malaria is a "bad air" or other bad influence that begets a certain disease, namely, malarial fever. I would like to ask you to turn to Dr. Koch's own writing in the *Deutsche Med. Woch.*, June 16, and tell your readers if he has fallen into the error of lumping cause and effect, or whether the *lapsus* has occurred in the course of transcribing his valuable observations into the English. By giving your readers a little light on this subject, you will, no doubt, confer a favor on others beside

Yours faithfully, ZETA.

Appendicitis.

RICHMOND, IND.

To the Editor:—I am quite disposed to favor the writer of the article on "Appendicitis" in the JOURNAL of May 14, as I am perhaps the cause of several articles which have appeared in the JOURNAL. . . . Dr. Carstens has made the *amende honorable* in the same propositions, which I quote from his second article in the JOURNAL of February 19. Apropos, the London medical men are and have been laughing over the question of "*What is Fame?*" which was brought out by the indifferent regard to such names as Treves and Talamon, when such names are quoted with much gusto, as Price, Deaver, Murphy, Fowler, Morris and others. The last mentioned, as if aching for a controversy, thrust in his lance of the quill, hoping somebody would recognize him as the New York gladiator on this important topic.

First then to Dr. Carstens' propositions, viz.: 1. "He (Dr. Haughton) and I agree that a diagnosis should first be made." 2. "He (Dr. H.) and I agree that a convalescent patient should not be operated upon." 3. "He (Dr. H.) and I agree that patients absolutely recover without recurrence and without an operation." 4. "He and I agree that some patients need an operation, and if there is any difference in our views, it is simply when is the best time." So he says, "finally, after all, we are near together; there is no use in splitting hairs about it, and I am perfectly convinced that Dr. H. is a good fellow who means well and, what is more, is progressive and wants the truth." This is making the *amende* (?) all right as I took his first article. . . . This is what I expected the New York man would do, and so I have waited for him to define and commit himself, which he has quite fully done in the article, which I am about to review. I do not know Dr. Morris, but I shall attempt to pay my respects to him also in this squib, which would never have been written if he had not openly thrust in his lance in the Carstens' episode. I quite fully recognize the animus of New York surgeons toward western surgeons, and if any man will read his last article in the JOURNAL, and do it carefully and dispassionately he will come to the conclusion that he is arbitrary and dictatorial in tone in the assumption which is here quoted from the editorial of the *Texas Med. News:* "We feel that we are guilty of no exaggeration when we assert that such men, viz., men occupying extreme positions in every profession, and especially so in medicine and surgery." I am glad he put that in, as I may have occasion to use it before I am done. These men he refers to

as occupying extreme positions, are dangerous elements in the medical profession, a menace to the well being of society. The editor of the *Texas Med. News* is personating Dr. Morris, and goes further in saying that *such extreme radical* teaching by influential members of the profession, such as Dr. Morris, "is well calculated to do great injury." We quite agree with the Texas editor, and I am glad he comes to the front like a man and declares his convictions. Dr. Morris hence classifies himself in the category as radical, as distinguished from conservative. I had always believed that the truth is usually found midway between two extremes, and in this case I am betwixt and between. I am conservative when best and radical when best, and Dr. Morris can not do my thinking nor indicate in my cases what ought to be done. I fear it is too much the tendency of the younger surgical profession in the East to think for the entire profession. It ought to be remembered that some of us who live West, where broad prairies bound our vision and large rivers roll carrying our trade, and white-winged ocean birds of commerce infuse powers and dignity and "no pent-up Utica bounds *our* powers." It ought to be remembered also that some of us in the West sat upon seats of medical colleges in eastern cities and received instruction from the honored names who instructed the same men who now are at the front in surgery. It ought to be remembered also that some of the illustrious names who have been called to eastern schools and have aided the development of surgery, were men gathered from western fields. Sims, Gross and Parvin and others, have gone East to medical centers, and we have heard their teachings, and if this idea prevails in any large degree let it be understood that we upon western soil are *men* of large mould, and our institutions are developing them, the peers of any age or class.

I have nothing to say for myself except that having spent fifty years in college, hospital and general surgical work, and having taught surgery for fifteen years, I do not permit them to be more careful in diagnosis or in operative methods, and always reserve the right to adjudicate the situation if I am to be the operator. This is just what Dr. Morris does, only he is too radical; and all the knowledge of this question will not die with him.

I desire that these men, who are in positions to teach, should remember that he teaches best who teaches facts which can be utilized in the future. One fact is worth a thousand theories, and one life saved by any process which is best is a fact worth more to patients than all the theories of ages. So we go for the facts. We ask, is it so? Can you prove it? Besides, if you do or can, it is more convincing than to abuse men who dare to think, investigate and logically work out conclusions, and then go to the bedside and demonstrate them. I do not believe more than half I see, and very little of what I hear. I am more fully occupied with what I think along surgical and medical lines.

Appendicitis proper. Its medical and surgical relations.—I desire to notify all that I did not desire or intend to be drawn into any controversy, and made no attack upon anybody, but I am not disposed to be dictated to as to what I shall do or think in this disease. I am in favor of a correct diagnosis, which I think but very few men can make differentially, and also in favor of a definite pathology of its progressive stages, as already well defined by writers, and whatever else may or can be known of the disease before we have determined to at once cut into and dissect out or remove what has always belonged to him, unless we assume that man was originated from a gorilla in the upward scale, and did not have an appendix at first.

"*Extreme Positions.*" Dr. Morris says "it makes a difference whether an extreme position is based upon knowledge or theory. The subject of appendicitis is so thoroughly understood by a *part* of the profession, and data so well classified, that we can now maintain the *extreme* position that operation should be done as soon as diagnosis is made."

Readers here will please notice that only a *part* of the profession (which part we are left to infer) is the New York portion of it, and the rest know nothing about it. Again, he admits his position is an *extreme* one and a *radical* one, and in view of all that is known to us in the West, where we see it perhaps as often as elsewhere, we are modest enough to say that the Doctor has mistaken his audience, if he supposes that men believe that all the facts of this disease lie in the immediate environment of the writer, who has assumed to say what must be done in any given case. I presume it will be admitted that on the first attack of pain, it can not be said: This is a case and operation must be made or the patient will die. This is a bold barefaced assumption, because my own considerable experience contradicts it. He cites diphtheria, etc., as infection, and reaches the other conclusion that the appendix is infected and must be removed to prevent further infection. We will take peritonitis. It may be simple or infecting. Does Dr. Morris, or any other man, open the abdomen, on diagnosis, to remove the infecting cause. Nay, he can not, he does not know what is the cause, and yet these cases where my own judgment would say to open the abdomen and disinfect it, as giving the best chances for life, are not so fully accepted by the cautious, honest surgeon, who values a human life more than he does his reputation or applause of men. Dr. Morris writes and talks like a man who did not intend to admit that there was but one side, that all other men were color-blind and he alone could see the *white* light. He talks as if the question had been already adjudicated and settled and he was the judge upon the bench to deliver the opinion, whereas he ought to remember that the profession of the United States and the world is but the great intelligent jury, who are determining the facts and evidence, and the time has not come for the judge to deliver his opinion to the jury. He says himself he is making an effort to gather up the statistics (that is, facts), and if so the evidence is not all in, nor the case closed. I quote a few lines from another (western man) of the medical profession, who says: "It is our opinion that operative surgery has been carried to an alarming extent; formidable operations involving the *lives of patients* have been performed upon the most trivial pretext or excuse. It is of daily occurrence to hear of women being submitted to operations, dangerous in themselves, for ailments that have been successfully relieved in the past by medication, and perhaps not one in ten, who may happen to survive the operation, are cured, and often are miserable sufferers the balance of life, while those who have succumbed and gone out of life are legion." He says further (American surgeons hear this arraignment of your surgery): "I do not hesitate to say, without fear of *successful contradiction*, that if the statistics were carefully procured the number of deaths from the effects of modern surgery, in the past ten years, will outnumber the deaths in both American armies during the late rebellion." I do not suppose it is so large (it may be) if we but reflect that in every city and town, and possibly at every cross roads, there is one or more surgeons who supposes "he carries his star in his brain," and is prepared, as he thinks, to diagnose and operate on any case presented to him, and, like Dr. Morris, is making cases for *statistics* and record.

"*Conservatism,*" "*philologists,*" "*radicals.*"—If we look over this ground the Doctor has seen fit to broach, we find only the same original idea of the man who imagines he is the old schoolmaster, or pedagogue, and imbued with the idea of hammering into his pupils his one idea: "I am the master of this small confederacy and you are subjects," viz., pupils. It is but a trite saying that such an idea is but a simple monarchy, which form of government becomes dissipated into thin air when pupils grow up, as it is now in Cuba, while Spain refuses to be convinced. What does he want to invoke the aid of philologists for in this question; because somebody used a word in Webster's Unabridged which is well understood,

where men are versed in the use of words to express ideas, and there is no necessity to call the attention of philologists to the use made of it. There is a degree of reckless surgery in many directions which is noticeable and we call a halt on this line, to say that the principles of pathology have been guiding us in determining our conditions along these lines, and "that every case should be operated upon as soon as diagnosis is made" is, to my mind, to ignore vital force and all other conditions having relation thereto; is a principle of surgical practice I have never subscribed to, and I am guided by the best pathologists of the past ages as to what inflammation is in its essential character, as well as its results upon the tissues involved. I know these things as well, I presume, as Dr. Morris; but I claim the right to do my own thinking in my own way, guided as I always am by the signals of our science and art, as well as by the principles of a conservative regard for human life and suffering. I know he claims the results of statistics to prove that under "proper surgical treatment" at the proper time, has been shown to be less than 1 per cent. in the hands of several American surgeons, that is, less than one death in one hundred cases. He claims this is proved. I do not accept it, because if the cases who do not recover after operation relief, are also given, we shall have a standard by which to judge of the results of operation. Figures on paper look well, but we want something more, as we have been in a number of large hospitals for six month periods and know something of the history of methods.

The unkindest cut of all by the writer under review is this, viz.: "That *conservatism* takes the place of knowledge." (We deny it.) That a large part of the profession is uninformed upon the subject of appendicitis, and the further suggestion that the profession is uninformed (that is, ignorant, to put it broadly) because it can not have learned "the unwieldly sum total of our advanced medical knowledge." Now, it is clear to every well balanced mind, on reading Dr. Morris's article, that he is in a state of mind. Just what that is would require possibly a *lunatico-inquirendo* into the mental question, before giving any value to such statements regarding the general medical profession of this country.

"Members of the profession to use their own judgment about the propriety of operation." If not, who shall decide? When doctors differ who shall decide? Now again: "Shall we let members of the profession all use their own judgment, or shall we ask the men who are thoroughly familiar with the subject to teach principles and make rules for aiding those whose opportunities for gaining accurate information have been more limited." Look at the presumption and the assumption of such a proposition to the American profession. When in every important city and town, and those also less so, there are hospitals and sanitariums as thoroughly equipped with men and modern means as even those of New York City, and men of much better balanced minds than the author of the paper under review, who are just as capable of investigation with the microscope and tests, and the knife, as our writer, hence it is downright presumption and ignorance of the facts of the qualification of the American surgeon, to have written such a diatribe against them. The writer from New York had better get out and come West and mingle with the profession more fully and freely in their State and county, and perhaps also the National conventions, and then go with them to the hospital fields of labor, and also to the private bedside of a large and very intelligent and educated clientèle, and he will begin to conclude he does not know it all and that possibly among all of these he may gather up some new facts about *bacteria* and results upon tissues, or the methods of performing successful operations upon his patients. It certainly is not probable or possible that all the knowledge of this subject, which has called out so much discussion and airing of surgical opinion, is found with Dr. Morris, and he at least ought to have learned so much as this, that an attempt to belittle the knowledge of his confrères in the general profession is a calumny which deserves to be widely resented, and the other spirit of generous confidence and yet independent and cautious statement in all medical investigation should be recognized as the inalienable right of him who devotes himself to the good of others and advancement of the profession to which "I (Dr. Morris) have sworn allegiance." I, not more than others, my dear sir, who have spent a lifetime in learning "what is truth," am still, with others, asking the same question. But Dr. Morris has not answered it upon this question, as is already well understood. We are open to the truth and say nothing about the *ipse dixit*, but we know and see the truth, when not offensively paraded before us, that in me lies the truth, all the truth of this question. Other men have some experience along this line, and as all truth is a unit it might be just as well if it was not projected so forcibly that, like a cannon ball, it overcomes all our sense of appreciation. This is but suggestive, however, to the Doctor, as it seems to me and I think will readily appear to others, that he himself is "intoxicated" with the "spirit of controversy," which he charges upon another. And in winding up his article he says: "Call it intolerance if you will, but I have no motive excepting that of being useful to the profession to which I have sworn allegiance." So be it, yet I trust in future he will stand behind the utterances (if for truth) and the "truth shall make men free," if they shall perceive it, more than the man. We shall rest just here and say, come on with your facts, your statistics, your experiences, if you have any, and let us compare notes and let there be an end of all this which from the first was sought to be avoided, but was drawn out finally by references and statements, which indicated that the writer was either "intoxicated" with his "spirit of controversy," or he had set himself the ignoble task of illuminating the benighted and ignorant profession, as it had not yet learned the density of the ignorance which had covered the professional mind upon this most important question, which has come down to the few years of this closing nineteenth century, to receive the flash-light of transparent truth in the *ipse dixit*. We will receive the truth, though it blind us.

R. E. HAUGHTON, M.D.

(*Finis.*)

NEW INSTRUMENTS.

EUREKA HOT-WATER VAGINAL APPLICATOR.

BY S. L. WEST, M.D.,
PHILADELPHIA, PA.

My apology for presenting a new hot-water vaginal applicator to the medical profession is that so far no approved method of applying hot water internally to the female pelvic organs is at our command; and the great necessity for prompt relief of the many minor ills arising from perverted and suppressed functions of those organs demands some commendable appliance. The hot water douche is only an apology for a better method of accomplishing the great demand for local treatment of those organs. To say the least, it is attended with discomfort and fatigue to the patient, and, as used by the majority of patients, its benefits are questionable.

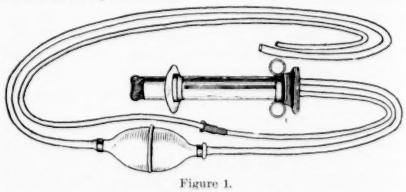

Figure 1.

The merits of the "Eureka Hot-Water Vaginal Applicator," which is here illustrated, at once commend it to the attention and approval of the medical profession. Its application may be briefly stated as follows: Freely soap the rubber bag (never use vaselins nor oils) and return or replace it within its holder, and open the cut-off on discharge of the rubber tube; place a pitcher of hot water, the hotter the better, conveniently near the side of the couch or bed, and drop the ends of the rubber tubes of the applicator into the pitcher; the patient reclines upon a couch or bed, on her back, with legs drawn up and knees abducted, and taking the applicator in either hand to suit her convenience, introduces the vaginal end of the applicator into the vaginal orifice, passing it up until the flange of

the applicator comes in contact with the labia, then placing the index and middle fingers of the other hand in the rings on the piston, she presses the rubber bag as high up into the vagina as can be comfortably borne, as shown by cut No. 2, holding the applicator in this position, and taking the rubber bulb on the feed tube in the other hand, she grips it two or three times, allowing the water to pass up through the rubber bag and flow out through the discharge tube. This removes the air from the rubber bag. Now close the cut-off and continue to pump water into the rubber bag. The amount of water required to be pumped into the rubber bag is determined by the discomfort produced by distension of the pelvic viscera, as shown in cut No. 3. As the parts become tolerant of the pressure, pump in more water. If it be desirable to continue the operation for fifteen minutes or half an hour, especially in chronic pelvic cellulitis attended with exudates, it will be well to empty and refill the vaginal bag, without removal, several times during the operation, thus producing the highest order of massage.

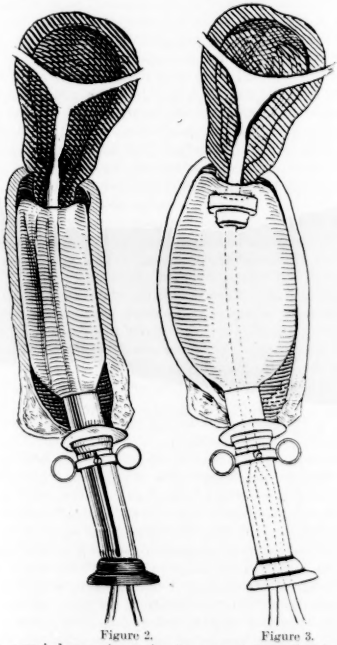

Figure 2. Figure 3.

After a varied experience in the use of the "Eureka Hot-Water Vaginal Applicator," covering a period of several months, I respectfully beg to refer especially to the following: In dysmenorrhea it gives prompt and immediate relief, relaxing the tissues and thereby promoting the menstrual flow. In climatic and neuralgic pains of the pelvic organs and viscera, it has no equal in promptly relieving the pain. In pelvic distress, heavy weight and bearing-down pains, the results of long standing or fatiguing walks, it acts like magic, restores the parts to a normal position and rapidly promotes absorption of the local congestion. In chronic pelvic cellulitis with inflammatory exudates and adhesions, it, under the relaxing influence of the hot water and expansion or equal tension of the tissues, most effectually breaks up the adhesions and rapidly promotes the absorption of the exudates.

BOOK NOTICES.

Scientific Memoirs by Medical Officers of the Army of India. Edited by Surgeon-Major-General J. CLEGHORN, M.D., C. S. I., Director-General of the Indian Medical Service and published from the office of the Superintendent of Government Printing. Calcutta.

This work has just reached this country. It is a small quarto of 130 pages beautifully illustrated with chromolithographed plates. It contains five papers, the first "On Choleraic and Other Commas," by Surgeon-Lieutenant-Colonel D. D. Cunningham, in which he gives interesting articles under subheadings as: A description of some new species of commas occurring in association with cholera in Calcutta; comma-bacilli occurring in bodies of water apart from the existence of any cholera in the vicinity, etc. Under the heading, "On the relation of bibrionic organisms to cholera" he states that the continued study of the bacteriology of cholera in Calcutta has in no way caused him to modify the views which he has on several previous occasions expressed in regard to the absurdity of talking of "the cholera bacillus." The longer the question is investigated in the endemic area of the disease, as represented by Calcutta, more and more evidence accumulates to show that the choleraic condition is not necessarily associated with the presence or predominance of any one species of vibrio within the intestinal tract, and that any assumption that such an association necessarily exists is merely founded on the fact that Professor Koch when in Calcutta, was either profoundly ignorant of bibrionic schizomycetes as a group, or that owing to his brief and limited local experience in the locality, he accidentally encountered only a single species in connection with the few cases of cholera which he had the opportunity of investigating. At the same time it must be allowed that he was the first observer who drew attention to the undoubted fact that a very special relation does exist between the occurrence of the disease and the predominance of the vibrionic schizomycetes within the digestive tract, for although a certain number of exceptional cases do occur in which the choleraic condition exists apart from the presence of any abnormal predominance of intestinal vibriones, there can be no question whatever that an association of the disease with such predominance is normal. The author concludes by insisting on certain facts: 1. Artificial administration of comma-bacilla very rarely serves to induce cholera. 2. Commas may be present in the intestinal contents of those to whom they have been administered without any evidence of the establishment of the choleraic condition. 3. Cholera may be present apart from any evidence of commas in the intestinal tract, and the numbers of vibrios and severity of the case do not necessarily run parallel. 4. The administration of different species of commas may be followed by the development of the choleraic state. 5. The physiologic properties of commas and other schizomycetes may unequivocally vary very greatly under different circumstances, and consequently the nature of the products to which they give rise in the substratum must also vary greatly. The second paper consists of notes on the malarial parasite as observed in the blood during life, and in the tissues postmortem at Lahore, Punjaub, by Surgeon-Captain J. Murray. He presents fine plates showing stages in the development of the quartan parasite, the tertian parasite, the quotidian parasite and those of malignant remittents. He cites many European observers but does not appear to be aware that any work of this kind has been done at the Johns Hopkins University. Then follows a paper in which Surgeon-Captain Leonard Rogers presents some observations and statistics to show that the incidence of malarial fevers is proportioned to the height and fluctuations of the ground water-bed level. The last two are by Dr. Cunningham: one on the results of experiments on the action of various reputed antidotes to snake venom, conducted during

the season 1895-96; the other on certain fungal and algal diseases affecting economic plants in India. The most important of the conclusions reached by Dr. Cunningham's experiments were: 1. The serum of the blood of animals which have been artificially immunized to the action of lethal doses of snake venoms by means of habitual and cumulative treatment with the latter, unequivocally possesses antidotal properties, and hence may fairly be denominated antivenene. 2. The term antivenene is, however, of generic, not specific value, for the antidotal material contained in the blood of animals which have been artificially immunized against colubrine venom is inert against viperine venom and *vice versa*.

Diseases of the Eye. By EDWARD NETTLESHIP, F.R.C.S., Ophthalmic Surgeon at St. Thomas' Hospital, London; Surgeon to the royal London (Morefields) Ophthalmic Hospital. Revised and edited by W. T. HOLMES SPICER, M.D., M.A., F.R.C.S., Ophthalmic Surgeon to the Metropolitan Hospital and to the Victoria Hospital for Children. Fifth American from the Sixth English Edition. With a supplement on color-blindness by WILLIAM THOMPSON, M.D., Emeritus Professor of Ophthalmology in the Jefferson Medical College of Philadelphia. With two colored plates and 161 engravings. Philadelphia and New York: Lea Brothers & Co. 1897.

A book which has passed through five editions needs no special recommendation. It is sufficient to say the present edition is fully up to date. It is unquestionably the best compendium on diseases of the eye ever written in the English language and, therefore, justly recommended in many medical colleges, for recitation work.

The supplement by Dr. William Thomson, on the practical examination of railroad employes for color-blindness, gives the work an additional value to physicians engaged in railroad service, as there is no one who who can speak more authoritatively on this subject or who has more practical experience in this work than the venerable emeritus professor of ophthalmology in the Jefferson Medical College.

Annual and Analytical Cyclopedia of Practical Medicine. By CHARLES E. DE M. SAJOUS, M.D., and 100 Associated Editors, assisted by Corresponding Editors, collaborators and correspondents. Illustrated with chromo-lithographs, engraving and maps. Vol. i. Philadelphia, New York and Chicago; The F. A. Davis Company, publishers. 1898. Price, cloth $5.00.

After ten years publication of the *Annual of the Universal Medical Sciences* in a series of five volumes every year, the plan has been changed so that hereafter one volume appears every six months and the whole alphabet will be covered in three years. Every three years therefore the subscribers will have a six-volume reference system which will cover the most that is valuable in the medical literature of the period. The volume before us is very handsome, attractively presented and is arranged alphabetically. The illustrations are fine; the paper and type are excellent.

We think in its present arrangement the "Annual" will be found more useful than heretofore because of its alphabetic arrangement.

A System of Medicine by Many Writers. Edited by THOMAS CLIFFORD ALLBUTT. Vol. vi. Pp. 1058. New York: The MacMillan Company, 1898. [From A. C. McClurg & Company. Chicago.] Price $5.00.

This volume is devoted to diseases of the respiratory organs in which are articles by Dr. Wm. Ewart, Dr. P. H. Pye-Smith, Dr. Percy Kidd, Dr. J. T. Arlidge, Dr. Rolleston, Dr. Kingston Fowler and Dr. James F. Goodheart; Diseases of the pleura by Dr. Samuel West, Dr. Gee, Dr. Herringham and Dr. D. W. Finley; diseases of the circulatory system by Professor Michael Foster, Dr. Monckton Copeman, Prof. Sherrington, Prof. Allbutt, Dr. Sidney Coupland, Dr. Samuel West, Dr. Wickham Legg, Dr. John Thomson, Dr. Stephen Mackenzie, Mr. W. Johnson Smith, Dr. Cheadle, Dr. Robert Muir, Dr. Dickinson, Dr. Laurence Humphry, Dr. F. T. Roberts, Dr. Thomas Oliver, Prof. Dreschfeld, Sir R. Dougles Powell and Dr. Ernest Samson.

There is a story in the author's preface which has a direct interest for American readers. He says: "An article by Prof. Welch on 'thrombosis and embolism' was to have been in my hands in ample time for the publication of this volume last Christmas. . . . Unhappily before the completion of his task Prof. Welch found himself committed to a desperate fight for the freedom of physiological research in the United States. As President of the Congress of American Physicians and Surgeons the duty fell upon him of organizing the profession in opposition to a bill now before Congress charged with restrictions so vexatious that all enlightened medical and scientific men in America consider that its enactment would be nothing less than a calamity. In addition to his laboratory and lecturing work Dr. Welch had to write innumerable letters, prepare papers and documents, organize committees, visit Washington repeatedly, have interviews with senators. He is unkind enough to add that all this trouble came from England where if your scientific men had made any sort of courageous stand twenty years ago I should not have been sacrificing my time and energies in this way. I am disposed to think that the trouble that I have caused you is a judgment for the delinquencies of your countrymen in this matter. Such are the uncertainties in the course of political business, that although Prof. Welch expected every week that the matter would come to a vote and thus liberate him to fulfill his obligations to me, yet week after week he has been disappointed and compelled to keep up agitation and organization. Even yet the fate of the bill is not sealed. Had Prof. Welch foreseen this grievous delay he would have withdrawn from his engagement in time for me to place the article in the hands of another contributor. This story I have ventured to tell at some length because it contains an interest and perhaps a warning for us all."

It will perhaps interest Prof. Allbutt to know that at adjournment of Congress the Anti-Vivisection bill remained unadjusted, but it is not believed that it can now pass either house of Congress. Nevertheless the profession in this country will take advantage of the summer vacation and personal contact with members of Congress and the Senators; to inform them of the consequences of this most ill-advised measure.

The work under consideration represents the present state of British medicine as set forth by some of its ablest exponents.

Hay Fever and its Successful Treatment. By W. C. HOLLOPETER, A.M., M.D. Pp. 137. Philadelphia: P. Blakiston Sons & Company, 1898. Price, $1.00.

The author says: "Having had remarkable and uniform success with the simple treatment of hay fever for the last ten years, during which time I have given complete relief to over 200 patients in my private practice, and having made a thorough clinical study of this affection, as well as an exhaustive review of the literature relating to it, I feel justified in presenting the results of my labors in this short treatise."

The treatment advocated by the author is strict sterilization of nasopharynx—daily sterilization. Surgical treatment is indicated, according to the author, only when gross lesions exist. In old cases the treatment should commence two or three weeks before the anticipated recurrence of the paroxysms.

The author has conferred a benefit on the profession in making his views public, for whether others sustain in actual practice the therapeutics here recommended or not, careful cleansing of the nasal passage must result in good, and many patients be relieved from the cruel and heroic measures so frequently recommended.

A copious bibliography concludes the book.

Schenk's Theory. The Determination of Sex. By Dr. LEOPOLD SCHENK. Authorized Translation. Pp. 222. The Werner Company: Chicago, Akron, Ohio, and New York, 1898.

The lay press has extolled this book to an extent that renders it unnecessary for a medical journal to say much. The

amount of sugar in the system, according to the author, determines the sex of progeny. For example, a woman with diabetes is nearly certain to have female children. And in all cases in which there is a predominance of female offspring the Trommer test shows the presence of sugar. The natural sweetness of the female sex is thus biologically accounted for. The question of diet is therefore the controlling factor under the Schenk theory. When male offspring are desired the diet should be on antidiabetic lines.

PUBLIC HEALTH.

Health in Chicago.—The report of the Department of Health for June gives 1581 deaths for the month, a rate of 0.98 per 1000 as compared with 1 per 1000 for June 1897 and 1.17 for June 1896. Of these deaths, 296 were of persons under one year old and 181 between 1 and 5 years. The principal causes were: Diseases of the nervous system, 224; consumption, 218; pneumonia, 142; diseases of the heart, 101; acute intestinal diseases, 88; cancer, 73; bronchitis, 47; typhoid fever, 35; diphtheria and membranous croup, 30.

Death rate in Diphtheria.—Prosessor Kassowitz of Vienna denounces antitoxin, stating that the published percentages are misleading and that the actual mortality from diphtheria has not diminished in recent years as claimed. He cited statistics from Moscow, London, New York, etc., which prove that the number of deaths has not decreased, whatever the percentages may show, while statistics everywhere prove that tracheotomy, primary or secondary (after intubation), is still followed by death in 70 to 90 per cent., that the number of cases of consecutive paralysis (heart death) has actually increased, and that renal complications are not affected by the antitoxin, while croup continues its course unchecked by the injections. He even refuses to consider the Klebs-Loeffler bacillus the specific cause of diphtheria, which he says is yet to be discovered. In the cities (Vienna, Paris) in which the mortality is actually lower of recent years, the disease has been of a milder type.

NECROLOGY.

EDWARD HAMILTON KIDDER, M.D., Fall River, Mass., died July 16, 1898, after an illness of some two or three months. Dr. Kidder was 32 years of age and a native of Lincoln, Mass. He attended Harvard University, graduating in the class of '88. After a year of teaching he went abroad for study and observation in hospital work. On his return he studied medicine, graduating from the Harvard Medical School in the class of '93. He was given an appointment as house surgeon at the Massachusetts General Hospital, serving nineteen months. He was especially devoted to the study and practice of surgery and was notably successful in his hospital practice in this work. He came to Fall River in 1894 and was a leading spirit in the organization of the Emergency Hospital and the Training School connected with it, and the success of these institutions has been largely due to his enthusiastic and energetic support. In the death of Dr. Kidder the profession and the city of Fall River alike suffer a distinct and appreciable loss. He was a man of unusually fine spirit, unsaving of himself in the work he had to do. His early end was in part the result of overwork. Dr. Kidder was a member of the Massachusetts Medical Society, the Fall River Medical Society and the Harvard Medical Alumni Association.

ALAN PENNEMAN SMITH, M.D., died July 18, at his home in Baltimore, M.D., in which city he was born in 1840. He was a son of Dr. Nathan Ryno Smith, a graduate of Princeton, and in 1861 of the University of Maryland, Medical Department. As one of the trustees of the Johns Hopkins University and as a member of many societies he was widely known despite his modest and unobtrusive ways. Early in his career he was in high repute as a lithotomist. Six children survive him, one of whom is a physician. He had many friends in the profession and out of it.

JOHN HEWITT WILSON, M.D., Glasgow, Scotland, 1844, of New York city, was found dead in his room July 15. Cardiac disease is given as the cause of death. He was born in Auchnacloy county, Tyrone, Ireland, in 1818, and came to America in the year after his graduation. Two daughters are his survivors.

R. O. MOFFAT, M.D., a young physician of Toronto, Canada, died in a dentist's chair from the effects of chloroform, July 18.

JAMES T. BALL, M.D., Colorado City, Colo., died near Judson, Ind., July 15, aged 39 years.——F. H. Bodenius, M.D., University of Heidelberg, Germany, 1869, of Madison, Wis., died at Baltimore, Md., July 21, aged 53 years.——Jacob Boon, M.D., Glen Olden, Pa., July 17, aged 61 years.——Frederick W. Vogel, M.D., Boston, Universty of Halle, Germany, 1868, died July 16, aged 52 years.——Henry E. Werner, M.D., Rush Medical 1888, died at his home, Le Claire, Iowa, July 16.

DEATHS ABROAD.—F. Cohn, professor of botany at Breslau, whose name will be remembered with those of Nägeli, Pasteur and Koch, as one of the founders of bacteriology.——Dr. Levieux, formerly physician to the Bordeaux Hospitals, corresponding member of the Académie de Médicine, aged 80 years.——Dr. Anton R. Kerner von Marilaun, professor of botany in the University of Vienna, aged 66 years.

SOCIETY NEWS.

Medical Temperance Association.—This Association, organized at the Washington meeting of the AMERICAN MEDICAL ASSOCIATION in 1891, has attracted a good deal of attention lately. Its particular object is the special medical study of alcohol as a medicine and beverage. Its members are almost all members of the AMERICAN MEDICAL ASSOCIATION, and the annual meeting is held at the same place and time as that of the ASSOCIATION. For several years it has held a summer meeting at Staten Island, in July, which has been largely attended by philanthropists and temperance reformers as well as medical men. The particular object of these meetings has been to group and collate a mass of testimony which has been both exaggerated and minimized by physicians and temperance advocates, and to point out the real facts and the lines of investigation now being pursued These meetings have followed National gatherings of reformers and been very influential in many ways. The meeting this year, July 5 and 6, followed a temperance congress of four days' length, closing the day before the medical convention began. The papers presented were purely scientific, but were listened to with much interest by a large mixed audience. Both the papers and discussions were temperate in tone and very reasonable suggestive presentations of facts and conclusions. Meetings of this character exercise a strong influence and are of great value to both the profession and the laity, correcting popular errors and rousing up new interest in a subject of increasing importance in every circle of society. Both the English and French societies have quarterly meetings, in which leading temperance men take part. Here the meetings are restricted to medical men. The medical side of the temperance question is a very large and almost unknown field, and increasing interest will follow the work of this society in the future.

The French Congress of Surgery will meet at Paris, October 17 to 22, with Professor Le Dentu in the chair. Nephrotomy will be the subject of addresses by Guyon and Albarran, and the "Treatment of Goiter" (exclusive of cancerous and exophthalmic goiter), by Reverdin of Geneva. For further particulars address Lucien Picqué, Secretary, rue de l' Isly 8, Paris.

Mississippi Valley Medical Association.—The twenty-fourth annual meeting of this association will be held at Nashville, Tenn., October 11-14, under the presidency of Dr. John Young Brown of St. Louis, Mo. The annual addresses will be made by Dr. Jas. T. Whittaker of Cincinnati, on medicine, and by Dr. Geo. Ben Johnson of Richmond, Va., on surgery. Titles of papers should be sent to the secretary, Dr. Henry E. Tuley, 111 West Kentucky Street, Louisville, Ky., as early as possible. Reduced rates on all railroads will be granted on the certificate plan.

Cumberland County Medical Society.—A meeting of the Cumberland County Medical Society was held at Hotel Cumberland, Bridgeton, N. J., July 12, and was presided over by Vice-President Dr. J. B. Ware. Dr. T. G. Davis of Bridgeton read a paper on "Nephritis in Children." Dr. H. W. Elmer, as delegate, reported on the AMERICAN MEDICAL ASSOCIATION, and Dr. L. L. Hand of Leesburgh on the State Medical Society.

The French Congress of Gynecology, Obstetrics and Pediatrics will meet at Marseilles, October 8-15. The subjects to be discussed are: Extra-uterine pregnancies; auto-intoxications during pregnancy; congenital hernias; microbian associations in diphtheria; school children's dyspepsia; infantile cardiopathy; the purpura, diplegia and colitis of infancy and paralytic club-foot.

MISCELLANY.

Not a Good Showing.—An English inspection reports that out of 8125 children scarcely 40 per cent. have normal vision in both eyes.

Chicago Policlinic.—This flourishing school has paid off the last of its indebtedness, and the building and grounds now belong to its Faculty without incumbrance.

Dr. Eugene S. Talbot, on account of his original investigations, has been elected honorary member of the Odontological Society of Spain.

Formaldehyde Only a Surface Sterilizer.—Dr. Harrington of the Harvard Medical School, after experiments, concludes that this gas has no penetrating power in the presence of moisture.

The Penalty of Philanthropy Remitted.—The Russian branch of the Red Cross Society has handsomely recognized by a pension of one thousand rubles, the services of M. Henri Durant of Geneva, now in poverty. This sum is to be paid annually.

Origin of Red Blood Corpuscles.—Dr. A. Pappenheim (*Virchow's Archives*, Band 151), after attaining his best results by fixing with heat at 120 degrees C. for five or ten minutes, then dipping five seconds in a concentrated sublimate solution and staining with alum carmin—methyl green, concludes that the red blood corpuscles are derived from the basophile leucocytes.

Sleep for Children.—(*Pediatrics*, Vol. v, No. 2; *Am. Medico-Surgical Bulletin*, July 10, 1898). The approximate period of sleep for children is given as between one and two years, six to eight waking hours; between four and six years, nine to eleven waking hours; between nine and 13 years fourteen to sixteen waking hours. Still the comment is that perhaps too much stress is laid upon the harm of over-sleeping, particularly in young children.

Hysteric vs. True Peritonitis.—Hopkins, *Colonial Medical Journal*; *Am. Medico-Surgical Bulletin*, maintains the rarity of the simulation of acute diffused peritonitis on the part of the hysteric. In neuropathic women the localized inflammatory affections are at times closely counterfeited. In hysteric peritonitis a slight touch of the skin is more distressing than deep pressure, although in neuropathic patients deep pressure in the hypochondriac region causes intense suffering. Pulse and temperature in simulated peritonitis are usually about normal, while vomiting is often present, but never nausea. Besides, the vomiting does not become fecal.

Correction of Curved Tibia.—Hopkins in the *Annals of Surgery* for July, describes an operation which consists of a combination, in a modified form, of osteotomy and osteoclasis. In reality, he performs two operations, incomplete osteotomy and osteoclasis; in the first, dividing the bone, with a chisel, one-half of its thickness at its inner curve. When the skin wound is healed, but before bone repair has restored the original strength, the osteclast is applied and the deformity corrected by a fracture at the weak point of the bone. He reports one case.

In Favor of the Post-Graduate Hospital.—The report of a special committee appointed to investigate charges against the New York Post Graduate Medical School and Hospital was adopted at a meeting of the State Board of Charities today. The charges were that money given for the endowment of beds had been misapplied, and that the city of New York had paid for children who had never been in the institution. The report says that the charges were not sustained.—*N. Y. Sun*, July 13.

Cerebro-spinal Fever.—Osler (*Maryland Medical Journal*, July 16) reports seven cases. He says the disease is never pandemic, but the outbreak is more or less localized and there is an absence of any continuous extension. He considers the treatment still in an unsatisfactory state, and in four of his cases recovery did not seem to follow the use of any special drug nor any special treatment. He advises sponging, etc., for fever, also an ice-cap and opium for the pain. Counter-irritation he considers important, the best method being to "touch along the spinal column lightly with the Paquelin cautery."

Multiple Neuritis.—Ruffin (*Medical Record*, July 9), points out that the diseases with which multiple neuritis are confounded are acute ascending paralysis of Landry, diffuse myelitis and spinal meningitis, anterior poliomyelitis and locomotor ataxia, it being most apt to be confounded with the latter. He believes that absolute rest in bed should be insisted on in all forms of the disease, and symptomatic treatment be resorted to. He advices massage as of great importance, often using it from the beginning of the attack. Aside from alcohol, he considers lead poisoning the most frequent cause for peripheral neuritis, paralysis of the wrist extensors being the most striking feature.

Cholelithiasis in Infancy and Childhood.—Wendel (*Medical Record* for July 9) writes concerning the symptomatology and diagnosis of these cases, basing his paper on observations of sixteen cases in persons under eight years of age. He confirms former observations that in young persons jaundice caused by gall stones without pain is rare, and says that in young individuals, as a rule, the expulsive faculty of the bile-duct does not permit the calculi to remain long in the common duct, and in these cases jaundice is so slight as to be apt to be overlooked. He believes that in every case of convulsion occurring without premonition, gall stone colic should not be exclued as a cause until a careful examination has been made, this being often overlooked in the case of young persons.

Milk for Infant Feeding.—Freeman presents a summary of the answers received to questions sent to the members of the American Pediatric Society as to whether the milk used for infant feeding should be heated for the purpose of killing germs, and if so, at what temperature and how long continued, in the *Archives of Pediatrics* for July. The replies showed a remarkable unanimity of opinion, the predominating opinion being that raw milk would be the best food if it were possible to obtain it clean, while a considerable number evidenced their willingness to take their chances with raw milk during certain seasons and under certain conditions. He believes that under

present dairy hygiene some sort of sterilization must be used, and favors pasteurization at a temperature of about 155 degrees F. for thirty minutes, followed by rapid cooling, as such temperature destroys the germs of diphtheria, typhoid fever and tuberculosis. This at the same time does not give the milk a "cooked milk" taste, and chemical changes would not occur until a temperature of 10 degrees higher was obtained.

Suture Material.—Gordon (*Medical News*, July 16), in a paper on "Suture and Ligature Material—Absorbable and Non-Absorbable," believes that silver wire is entitled to preference over nearly all kinds of non-absorbable material, silkworm gut coming nearer to this than any other. His conclusions are: 1. All suture material unabsorbed must necessarily have more or less exudate about it. 2. Such exudate is of lower vitality than normal repair where tissues are just approximated and not strangulated. 3. A few days only are necessary to insure repair, if there is no infection, and therefore in cases where no great amount of strain exists, absorbable sutures only are needed. 4. Where continual strain on the parts is inevitable, non-absorbable sutures should be used for at least two weeks, but should be so placed as to be removable. 5. For such sutures silkworm gut seems to be the best, as it can be made sterile and kept so. 6. For all other purposes catgut is sufficient. 7. Inflammation is always destructive to complete repair. 8. Inflammation is always due to infection. 9. Sterile catgut or kangaroo tendon should therefore fulfil all indications for suture or ligature material, with the exceptions named.

Anomalous Cords of the Heart.—Lewis (*Philadelphia Medical Journal* of July 16) in a dissection of eighty hearts, found fifty-one showing anomalous cords. Some of the hearts were from monsters, a few were abnormal only as to their tendinous cords and the others pathologic. Thirty-two of the fifty-one had abnormal bands across the cavity of the left ventricle and in twelve of these more than one such band, some being branched or forming a net-work across the cavity. As to the right ventricle, twelve contained one or more such bands, and in five of these they were multiple. Six of the above showed aberrant cordæ tendineæ in both ventricles, and in six there were one one or more cords, or a network running vertically across the posterior appendix of the right auricle. Thin cords singly or in net-work occurred in eight cases in addition to or in place of the valve of the coronary vein, and four hearts had bands stretched between the papillary muscles. No case showed a cord across the cavity of the left auricle. He believes that the aberrant cords are of clinical significance in adding murmurs which obscure the cardiac sounds, or serving as points on which the blood may clot, or interfering with the complete opening or closing of the mitral or tricuspid valves.

That Tuberculosis Number.—We notice that our esteemed contemporary, the Philadelphia *Medical Journal*, is patting the London *Practitioner* on the back for publishing a recent issue entirely devoted to tuberculosis, a movement which originated with the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION with the issue of Feb. 5, 1898, but which our valued contemporary did not venture to make mention of, although in that issue of the JOURNAL there appeared thirteen original articles, comprising forty pages of two columns each, on various phases of tuberculosis, also two exhaustive editorials and several pages of miscellaneous items on the subject. In addition to this mass of matter on this special subject, the JOURNAL of that issue also contained other editorial and department matter on general subjects. These papers were from the pens of leading men in medicine throughout the country, and a column of the JOURNAL is practically equivalent, in amount, to a page of the *Practitioner*. When it is remembered that the *Practitioner* is a monthly publication and that this issue of the JOURNAL was our regular weekly edition, the matter is still more noteworthy.

In Praise of Ebriety.—To show how the times have changed, let it be known that an old and curious book exists upon the virtues of alcoholic addiction. It was printed for E. Curl, against Catherine Street, in the Strand, London, in 1723, and is marked "Price Five Shillings." The title is as follows: "Ebrietatis Encomium, or the Praise of Drunkenness; wherein is authentically and most evidently proved, the necessity of frequently getting drunk; and that the practice of getting drunk is most ancient, primitive, and catholic. Confirmed by the example of Heathens, Turks, Infidels, Primitive Christians, Saints, Popes, Bishops, Doctors, Philosophers, Poets, Free-masons, and other men of learning in all ages. By Boniface Oinophilus, de Monte Fiascone, A. B. C."

Vinum retificans cor hominis,
Narratur et Prisci Catories,
Saepe mero caluisse virtus.
—Horatius.

The author lays down the following rules for getting drunk, to-wit: 1. Not too often. 2. In good company. 3. With good wine. 4. At convenient times. 5. Force no one to drink. 6. Do not push drunkenness too far.

A Medico-Cleric gets Some Advice Gratis.—The *Lancet* tackles a would-be homeopathic clergyman as follows: "We extract the following advertisement from the Bazaar:"

MEDICAL.—Wanted Standard Homeopathic books and drugs. Hints gratefully accepted. VICAR B.

We are happy to give "Vicar" a hint and hope he may be as grateful for it as he promises to be in the advertisement. We might multiply hints, but one hint will cover all the ground. It is that he should not interfere with what he does not understand. Suppose he drugs a person and that person dies, "Vicar" can not sign a death certificate, at least not a valid one. In that case the Coroner at the ensuing inquest would certainly make strong remarks upon "Vicar's" unfortunate position, and "Vicar" might even find himself nearer a trial for manslaughter that would be seemly in one of his cloth.

Curvature of the Neck of the Femur.—Frazier writes on this subject, sometimes called "Coxa Vara," in the *Annals of Surgery* for July. He says there is usually no relation between the physical development of the patient and the deformity. Atrophy of the muscles of the thigh is present to a greater or less extent in every case, according to the amount of functional disturbance of the joint, and in some cases the difference in circumference between the two thighs amounts to seven centimeters. The trochanter major is usually displaced upward; in many cases, upward and backward, and upward and forward in not a few cases. As to the attitude of the limb, in sixty cases in which the position was abnormal, fifty-four presented outward rotation. Occupation seems to be the predisposing cause, also sex, 70 per cent. occurring in males and 30 per cent. in females. For diagnosis, he advises examination as to the following points: atrophy; position of the trochanter in relation to Nélaton's line; relative length of extremity, measured from anterior superior spine to internal or external malleolus; actual length of extremity, measured from tip of trochanter to external or internal malleolus; extent of outward rotation; limitation of inward rotation; restriction of abduction and adduction and disturbances of flexion or extension. Treatment includes rest, extension and massage, with attention to hygiene and phosphorus internally, if there are evidences of rickets. Operative interference is reserved for cases in which the disability is pronounced.

Venomous Spiders.—Dr. Andrew Ross of New South Wales has reported a supposed case of serious toxic effect from the bite of a spider. A boy, aged 5 years, while eating some bread and butter on a doorstep, suddely cried out and complained of being bitten on the neck behind the lobe of the right ear. He pulled his hat off and threw it on the ground, when a large black spider with a bulbous belly and red spot on the back was

discovered inside and instantly killed. Curious toxic symptoms shortly afterward began to develop in the patient. These were mainly acute pains in the legs and feet and inability to stand or walk. On examination, a large erythematous circle at the spot where the spider was supposed to have bitten him was found. The restlessness and acute suffering continued, and nothing afforded any relief. The affected part was bathed in hot water, and at short intervals strong doses of ammonia were administered and teaspoonfuls of strong brandy were given until about four wineglassfuls had been used, but the symptoms were unrelieved. It was not until five emetics had been taken and full vomiting induced that the patient began to improve. Subsequently he recovered, but his convalescence was for some days delayed by the loss of power in the lower limbs, and recurring attacks of pain. The genus to which the spider belonged was probably *lactrodectus*, of which in Australia there are two species, viz., *L. scelio* and *L. parseltii*. The bite of all species of this genus in every part where they are found, as for example in Southern Europe, California, North Carolina and New Zealand, is credited with venomous qualities in a marked degree and deaths of human beings have been reported as the result of such bites. Some dead spiders of the Australian species which were sent to Professor Kobert of the Dorpat University were found to be inert as far as poisonous properties were concerned.—*Medical Press and Circular.*

Cincinnati.

A VACCINATION STORY.—Some months ago a bona fide case of smallpox was detected in the receiving ward of the Cincinnati Hospital. He had lately been in a region known to be infected, and his latest boarding house was in a very densely inhabited part of the city, peopled for the most part by negroes. It was deemed necessary by the health department that vaccination should be carried out in this locality on a large scale. Many laughable incidents are narrated by the physicians to whom the work was assigned. The greatest difficulty was encountered in making them submit, and only threats of a "ride in the wagon" could influence the most of them. But when vaccinated, they became most zealous in pointing out to the amused officers the hiding places of others in the building. One dusky matron called up stairs after her own arm had been thoroughly vaccinated, "Mistah doctor, dar's a low-down niggah under de bed in de fron' room." One of the physicians in his enthusiasm pounced upon the bed in question, which with a crash came to the floor, scattering bed-slats and curses with equal impartiality in every direction. "Say, white men, can't ye let a feller sleep?" came from the depths of the ruins, but his earnest plea was disregarded, much to the delight of the already vaccinated darkies who had gathered around to see the fun.

San Francisco.

SAN FRANCISCO COUNTY MEDICAL SOCIETY.—At the June meeting Dr. Thorne reported a case of removal of the stomach, gastrectomy, which he stated was the fifth operation of this kind that had been made. The patient was a German woman 52 years old, and the family history was quite negative. She had done a good deal of hard work, principally at the washtubs, and had always had a good appetite. For about four years there had been a good deal of gastric disturbance, principally confined to pain after eating, also flatulency. When examined the tumor was found to be kidney-shaped in the left hypogastric region and freely movable. It was not differentiated from a misplaced kidney, though the two alternative conditions of cancer of the stomach and floating kidney were recognized. The patient entered the hospital on June 23, and was operated upon on June 26. All preparations had been made to remove the stomach, if the condition was found to be one of cancer of that organ upon opening the abdomen. This was found to be the case, and the operation for removal was at once undertaken. The omentum was ligated in sections and tied off. Several adhesions were treated in the same way, and the organ at last freed from its connections. The intestine below the pyloris was seized with a strong forceps, the blades of which had been covered with rubber tubing and the stomach tied off and cut away; a similar method was employed in dealing with the cardiac end of the stomach. The esophagus had to be dissected away from adhesions and ligaments before it could be brought down low enough to tie to the intestine. The cut ends were united by means of a Murphy button reinforced by a line of sutures. During the operation the patient had been given regular doses of strychnin and whisky, hypodermically, and the total time of operation was two hours and forty-five minutes. She recovered from the anesthetic well and suffered little or no pain, but was intensely prostrated. Strychnin, whisky, digitalin, etc., were given at frequent intervals, but the patient steadily sank; she was conscious and rational until the last, but died forty hours after the operation. Her system had been so reduced by the long continuance of the disease that she was unable to rally from the slight shock of the operation. Dr. Chas. G. Levison reported several cases of operation upon the kidney, with one of nephrectomy for angioma of the left kidney, the twenty-eighth case reported as successfully operated upon. The diagnosis was very difficult, as there was no symptom except the frequent appearance of blood in the urine, which when it occurred, was in considerable amount. When there was no blood present the urine was free from casts, cells or crystals, and no indication of a diseased kidney was to be found. At the time of hemorrhage the blood and clots so filled the bladder that it was impossible to obtain any information by means of cystoscopy. It occurred to the doctor to make a trifle more pressure on the region of the kidney and see if any hemorrhage resulted; in this way he imagined he could gain some information as to which kidney was the affected one. This was tried on the left side first, and the experiment was followed in fifteen minutes by a free flow of blood. On this indication the operation was directed to the left kidney, which was found to be the site of a large angioma, located in the lower portion of the kidney. The operation was entirely successful, and the patient has quite recovered with no indication of any recurrence.

Philadelphia.

MORTALITY STATISTICS.—For the week ending June 16 there were 493 deaths, a decrease of 227 from the previous week and 135 from the same period last year. The low mortality for the week is no doubt due directly to cooler weather, there being fewer deaths noted among children.

INFECTIOUS DISEASES.—This week: Diphtheria, 14 deaths, 73 cases; scarlet fever, 27 cases; typhoid fever, 5 deaths, 50 cases. Last week: Diphtheria, 11 deaths, 49 cases; scarlet fever, 3 deaths, 17 cases; typhoid fever, 13 deaths, 50 cases.

PREVENTION OF DEATH FROM LIGHTNING.—During the 4th of July festivities, while thousands of persons were in Fairmount Park, a severe thunder-storm came on, and while there was only one or two severe flashes of lightning, one of them struck in the midst of a crowd sheltered under a tree, killing three persons instantly. It now seems that the Park Committee on further inquiry learned from several leading physicians that suspended animation following lightning stroke does not always prove fatal provided the necessary precautions are taken. Dr. J. Howard Taylor, Chief Medical Inspector of the Board of Health, is quoted as saying: "There can be no doubt that there are cases of suspended animation from lightning stroke or other electric shock just as there are such cases of drowning. There certainly ought to be rules thoroughly known by police and park guards for the treatment of victims of electric shocks. Such rules would be of especial value in saving the lives of men shocked by electric wires in case of fires, etc. The fact that death is not always instantaneous following an electric shock reflects unfavorably

on punishment of criminals by electrocution." It is also stated that the United States Weather Bureau has tabulated some imported statistics regarding this subject. "In the United States for the five years 1890-1894, 1120 lives were lost by lightning stroke or an average of 224 lives each year. Nearly all of these fatal loses occurred from the month of April to September, the maximum deaths occurring during June and July. Thickly settled communities are far less subject to lightning stroke than sparse settlements. In general the risk in the country is five times greater than in the city. Geologic conditions are also important factors, as for instance chalk is least susceptible to lightning stroke. Marl is twice as liable as chalk, clay seven times as liable, sand nine times and loam twenty-two times. Different kinds of trees are liable in different degrees. The oak is most frequently struck, while the beech is least frequently affected. Pines are struck fifteen times more frequently than the beech and the oak fifty-four times. Most generally trees struck are those standing in the clear or on the edge of forests, their height averaging from fifty-two to sixty-six feet." It is reported that the lightning strokes which recently proved fatal concur accurately with these statements. Since this subject has received the attention of the Park commissioners and physicians, it is proposed that rules be formulated for the proper guidance of park guards in resuscitating patients, such as arousing the patient, application of the cold douche, friction of the extremities, warm applications, administration of stimulants, and artificial respiration to be persisted in for at least one hour.

REPORT OF HOWARD HOSPITAL.—The 44th annual report has just been issued. The total number of new cases treated in the hospital and dispensary was 8306, compared with 8431 last year, 8438 for 1896, and 7167 for 1895. The total number of visits of patients was 32102, compared with 28180 last year and 28065 for 1896. Of the total number of new patients there were 6491 white and 1815 colored, 3911 being males and 4395 females. Nativity: United States, 6140; Ireland, 1278; Italy, 318; Russia, 221; Germany, 173; England, 129; Scotland, 47. For 1897, of 8431 cases treated, the nativity was as follows: United States, 6092; Ireland, 1447; Russia, 255; Italy, 240; Germany, 183; Scotland, 47; France, 7; Arabia, 4.

A third story has been added to the annex department and a sick diet kitchen constructed on the second floor, greatly facilitating the preparation of proper food for patients. The total receipts as shown by the treasurer's report were $35,378.84, and the expenditures $31,438.59, leaving a net balance in cash, March 1, 1898, of $3,912.30.

MEDICAL EXAMINING BOARD.—As a result of the examination for licensing physicians by the State Board of Pennsylvania, 317 applicants presented themselves for examination; out of this number 271 obtained certificates, 43 failed to pass, 2 were dismissed for unfair methods, while one withdrew to join the army. A fee of $25 must accompany each application, which fee is divided among the members of the Board. Dr. W. B. Stanton of Philadelphia received the highest general average, 91.73, out of a possible 100.

AFFECTED WITH TUBERCULOSIS.—Dr. Pearson, of the Veterinary Department of the University of Pennsylvania, and State Veterinarian, has recently made his report to Governor Hastings in regard to the work of the State Live Stock Sanitary Board. It is stated that from June 1, 1897, to June 1, 1898, 1900 cattle were inspected and the number of infected cattle was 12 per cent. The greatest number of infected cattle came from New York, New Jersey and Maryland, while some came from the Western States. Of 1000 cattle from Ohio six were found affected. Dr. Pearson has been appointed to represent Pennsylvania at the International Tuberculosis Congress at Paris, July 27 to August 3, inclusive, and is now on his way to that city.

Louisville.

LOUISVILLE MEDICAL COLLEGE.—Attorney John S. Jackman has just been appointed by the judge of the common pleas court a receiver for the Louisville Medical College property. Some weeks ago the Fidelity Trust and Safety Vault Company filed suit in the law and equity division for sale of the property, being large holders of the college paper, and a decree of sale was ordered. An appeal was taken by Dr. Samuel Cochran to the court of appeals, and pending a decision of this, a receiver was asked to preserve the property and lease it. Several pleadings were filed in this suit, several sensational statements being made by Dr. Samuel Cochran in regard to the financial conduct of the institution.

LAWS.—Dr. Wm. V. Laws, for some time assistant to Dr. J. M. Mathews, has accepted a position in the Medico-Chirurgical College of Philadelphia, as demonstrator of surgery, where he will be associated with Prof. Wm. Rodman, formerly of this city, professor of surgery and clinical surgery. Professor Rodman will not leave for Philadelphia until September 30, having an office for the summer at Second and Walnut Streets.

MATHEWS.—Dr. J. M. Mathews, president-elect of the AMERICAN MEDICAL ASSOCIATION, and Mrs. Mathews, who have been spending some time on the California coast, have returned.

MARVIN.—Dr. J. B. Marvin and family will sail August 1 for Europe, for the summer months.

CARTLEDGE BULLITT.—The profession of Louisville have received announcements of the partnership of Dr. A. M. Cartledge and Dr. James B. Bullitt. They will office at Second and Broadway.

MCMURTRY.—Dr. L. S. McMurtry will spend his vacation fishing in the Canada lakes.

MEYERS.—Dr. Sidney J. Meyers, until recently associated with Dr. Wm. L. Rodman in this city, has been appointed acting assistant surgeon in the army and has reported for duty to General Brooke at Chickmauga, Ga., in the division hospital.

ADDRESSES.—At a meeting of the Executive Committee of the Mississippi Valley Medical Association, the following were chosen to deliver the annual addresses at the next meeting in Nashville: Dr. James T. Whittaker of Cincinnati, on medicine; Dr. George Ben Johnson of Richmond, Va., on surgery.

COMMITTEEES.—The following are the Committees appointed by the Chairman of the Committee of Arrangements for the next meeting of the Mississippi Medical Association: Arrangements: Duncan Eve, Chairman; W. D. Haggard, Jr., Secretary; J. A. Witherspoon, Paul F. Eve, R. E. Fort, S. S. Crockett, G. C. Savage. Reception: L. B. Graddy, Chairman; W. A. Atchison, W. D. Haggard, Sr., W. F. Glenn, W. L. Dudley, James B. Stephens, W. C. Bilbro. Entertainment: J. Y. Crawford, Chairman; W. G. Ewing, Larkin Smith, A. B. Cook, J. W. Handey. Exhibits: Dr. Deering, J. Roberts.

QUARANTINE.—The epidemic of smallpox in Jackson County has assumed such a serious aspect that, as the county court will not appropriate sufficient funds to stamp it out, the State Board of Health has, by the Executive Committee, at a meeting held at the office of Dr. Wm. Bailey, on the 21st inst., declared a rigid quarantine against Jackson county. The adjoining counties are Madison, Clay, Estell, Lee, Owsley, Laurel and Rockcastle. The Quarantine Proclamation states that "After due notice and repeated urging from this and the County Board of Health, the authorities have persistently failed to take any steps to prevent the spread of this highly dangerous and contagious disease . . . the State Board of Health of Kentucky . . . declares Jackson County and each of its inhabitants to be in quarantine, and establish the quarantine line along the entire boundary of said county, and forbids any person to enter or leave said county without a special permit from this Board, under the pains and penalties of law, which is a fine of not less than $50, nor more than $500, or imprisonment in the county jail of not less than sixty days, or both fine and imprisonment." This is the first time in sixteen years that an absolute quarantine has been declared in the State.

Societies.

The following recent meetings are noted:

Illinois.—Iowa and Illinois Central District Medical Association, Rock Island.

Indiana.—Mitchell District Medical Association, West Baden Springs, July 19 and 20; Tri-State Medical Association, Elkhart, July 19.

Iowa.—Botna Valley Medical Society, Atlantic, July 14.

Maryland.—Cecil County Medical Society, Elkton, July 14.

Minnesota.—Interurban Academy of Medicine, Duluth, July 20.

Missouri.—St. Louis Medical Society, July 14.

Ohio.—Eastern Ohio Medical Association, Steubenville, July 12; Muskingum County Medical Society, Zanesville, July 14; Northern Ohio District Medical Society, Fremont, July 21.

Pennsylvania.—Cumberland County Medical Society, Newville, July 12.

Texas.—Briggs Medical Society, Waxahachie, July 12; Central Texas Medical Association, Temple, July 12 and 13.

Vermont.—Rutland County Medical and Surgical Society, Burlington, July 12.

Virginia.—Seaboard Medical Association, Norfolk, July 15 and 16.

THE PUBLIC SERVICE.

Movements of Medical Officers in Active Service.—Assigned to duty with the 2d Army Corps, General Wm. M. Graham, Camp Alger, Va.: Majors Jabez N. Jackson and Wm. F. de Niedman, brigade surgeons. To the 3d Army Corps, General James F. Wade, Chickamauga Park, Ga.: Major Guy L. Edie, brigade surgeon, from San Francisco, Cal., and Acting Asst. Surgeon Robert W. Andrews from Poughkeepsie, N. Y. To the 4th Army Corps, General J. J. Coppinger, Tampa, Fla.: Major Edward Martin, brigade surgeon, relieved from duty with the 2d Corps; Capt. E. L. Munson, U. S. A., from Ft. Monroe, Va., recently from Santiago, Cuba; Capt. Allen M. Smith, U. S. A., from Ft. Hamilton, N. Y., and Capt. Champe M. McCulloch from Ft. Barrancas, Fla., and the following acting assistant surgeons: Irving E. Bennett from Ft. Delaware, Del.; Patrick H. McAndrew from Washington, D. C.; G. Moreno de la Torre from the hospital transport *Olivette*; E. A. Romig from Big Rapids, Mich., and Paul C. Hutton from Washington, D. C. To the 5th Army Corps, General Wm. R. Shafter, Santiago, Cuba: Major W. C. Gorgas, brigade surgeon, relieved from the hospital ship *Relief*; Acting Asst. Surgeons R. Fleming Jones and H. J. Thomas from Winston, N. C., to go by way of Tampa, Fla.; Acting Asst. Surgeons Aristides Agramonte and Charles T. Newkirke from Washington, D. C., to go by way of New York City; Acting Asst. Surgeons Paul Mazzuri and Myer Herman from New Orleans, La., and J. F. Archer from Shelby, Miss., to go by shipping on the *Resolute* at New York City, and Acting Asst. Surgeon Domingo Lagomasino and Asst. Surgeon B. H. Kittrell, 1st Mississippi Volunteer Infantry, to go by shipping on the *Olivette* at New York City. To the Leiter general hospital, Chickamauga Park, Ga.: Capt. Geo. M. Wells, Asst. Surgeon U. S. A., from Ft. Ringgold, Texas, and acting assistant surgeons John A. Metzger and Ira C. Brown from Washington, D. C. To the general hospital, Ft. McPherson, Ga.: Major Royce D. Fry, brigade surgeon. To the general hospital, Ft. Monroe, Va.: Capt. Francis A. Winter, Asst. Surgeon U. S. A., and acting assistant surgeons Samael P. Cottrell and Edward J. Mayer.

Nominations by the President.—To be Asst. Surgeons: 2d Volunteer Engineers, Edward J. Barrett; 3d Volunteer Cavalry, Edward S. Grigsby; 2d Volunteer Infantry, Charles Bruning, and 3d Volunteer Infantry, William A. Chapman.

Major George Franklin Shiels has resigned from the 8th California Volunteers to accept position as brigade surgeon.

Resigned.—Major George D. Ramsey, Surgeon, 69th New York Volunteers.

Disability Existing Prior to Enlistment.—The following, providing for the discharge of volunteer soldiers unfit for military service by disabilities existing prior to enlistment, was published from Headquarters of the Army, July 16, 1898. The necessity for this was developed by the examination of men for transfer from the line of the volunteers into the hospital corps of the regular army. So many of these men were found to be physically unfit for service that a general weeding out was considered necessary:

Information having reached the War Department that, notwithstanding the medical examination prior to muster in, men have been enlisted in the Volunteer Army who should have been rejected at that examination as unfit for military service, the attention of chief surgeons is directed to this subject as one of great importance. Systematic inquiry, with a view to eliminating such men, should be made in the various regiments and other commands by the medical officers on duty with them. A board of medical officers should be appointed in each division to carefully examine and make recommendations in each of the cases submitted by individual or regimental medical officers. In every case where discharge from service is recommended it should be seen that the certificates of disability embody a statement to the effect that the cause of the disqualification for the military service existed prior to the enlistment of the man, if such is found to be the fact. Department and corps commanders are authorized to order discharges on certificates of disability, such orders to be carried out by the regimental, independent battalion, battery or detachment commanders as the case may be. Such provisions of paragraph 140 of the Regulations as are inconsistent with the foregoing are suspended during the war.

In the examination of certificates of disability for discharge, it is enjoined upon the chief surgeons, and others accountable, to observe that there is no conflict between the reports of company commanders, medical and other officers thereon, as to whether disability was incurred in line of duty, or not in line of duty. If any discrepancies exist in this particular, every possible means will be employed to harmonize the reports before finally forwarding the papers to the Adjutant General of the Army.

PAMPHLETS RECEIVED.

A Second Contribution to the Treatment of Cancer by Injections of Alcohol. By Edwin J. Kuh, Chicago. Reprinted from Phil. Med. Jour.

Annual Report of the Board of Health of Winona, Minn. Paper. Pp. 8. Winona: 1898.

Baltimore Medical College. Annual Announcement of.

Diseases of Tropical Climates: their Prevention, Diagnosis and Treatment. By T. S. Dabney, New Orleans, La. Reprinted from N. Y. Med. Jour.

Etiology and Pathology of Delirium, The. By. C. W. Simmons, Philadelphia. Reprinted from Med. Times.

Gross Medical College: Circular of Information, Denver, Colo.

Das Ichthyol in seiner Verwendbarkeit f. die Schiffs- und Tropen-Praxis. By Dr. Leo Leistikow, Hamburg. Reprinted from Archiv. f. Schiffs- und Tropen-Hygiene.

Kryofine. By Eugenie Back. Reprinted from New Eng. Med. Mo.

L'Ichthyol les Lymphangites de l'enfance and leurs Consequences. By Dr. Moncorvo fils, Rio de Janeiro.

New and Original Method of Osteoplastic Resection of the Skull. By J. J. Buchanan, Pittsburg. Reprinted from Med. Record.

Radical Cure of Inguinal Hernia by Prof. Kocher's Latest Method. By J. J. Buchanan, Pittsburg. Reprinted from Phila. Med. Jour.

New Forceps for Intestinal Anastomosis. By Ernest LaPlace, Philadelphia. Reprinted from Phil. Med. Jour.

Observations upon the Diagnosis and Surgical Treatment of Certain Diseases of the Stomach, Based upon Personal Experience. By W. J. Mayo, Rochester, Minn. Reprinted from Med. Record.

President's Address before the So. Carolina Med. Association. By Chas. W. Kollock, Charleston, S. C.

Prostatorrhœa Simplex and Urethrorrhœa ex Libidine. By F. R. Sturgis, New York, N. Y. Reprinted from Jour. of Cutan. and General-Urinary Diseases.

Pulte Medical College: 27th Annual Announcement. Cincinnati, Ohio.

Relations of the People of the United States to the English and the Germans, the. By William Vocke, Chicago.

Report of the Committee on Car Sanitation. By Granville P. Conn, Concord, N. H. Reprinted from Trans. of Am. Public Health Association.

Sanitary Redemption of Havana: the Need and the Means. By George Homan. St. Louis, Mo. Reprinted from Med. Review.

Septic Perforation of the Right Internal Carotid Artery. By A. Jacobi and James Ewing, New York, N. Y. Reprinted from Phila. Med. Jour.

Tribute to Dr. J. N. Brown. By W. F. McNutt. Reprinted from Pacific Med. Jour.

Tonic and Spasmodic Intestinal Contractions with Report of Cases; Two Interesting Cases of Intestinal Resection with End-to-end Anastomosis. By X. O. Werder, Pittsburg, Pa. Reprints.

Ueber die Andwendung des Ichthyols bei Augenkrankheiten. By Dr. M. Elerson, Tarnow. Reprinted from Klin-therap. Woch.

Woman's Medical College of Baltimore. Announcement and Catalogue.

Woman's Medical College of the New York Infirmary for Women and Children. Catalogue and Announcement.

Woman's Medical College of Pennsylvania. Catalogue and 49th Annual Announcement. Philadelphia.

CHANGE OF ADDRESS.

Burroughs, H. S., from 6200 Penn to 301 N. Highland Avenue, Pittsburg, Pa.

Braughton, G. A., from Chino, to Oxnard, Cal.

Campbell, T. F., from Belle Fourche, S. D., to Springview, Neb.

De Witt, Dr., from 1643 Polk to 1196 Kentucky Street, San Francisco, Cal.

Faukboner, A. V., from Fairmount to Summitville, Ind.

Ferguson, C. J., from 574 South Fremont Street to the Denison Bldg., Denver, Colo.

Fithian, J. W., from Camden to Sea Girth, N. J.

French, E. H., from Piqua, to Glendale, Ohio.

Grieger, H., from 3132 Boulevard to Cheesman Block, Denver, Colo.

Gilbert, B., from Denver to Durango, Colo.

Gordon, H. S., from Tombstone, Ariz., to 2508 South Flower Street, Los Angeles, Cal.

Gillmore, R. J., from Denver, Colo., to 460 E. 63d Street, Chicago, Ill.

Hannan, J. C., from Hoosick Falls to Fort Chester, N. Y.

Keen, E. J., from Denver to Longmont, Colo.

Klein, M. J., from 1128 Washington Boul., to 823 Lincoln Avenue, City.

Loeb, L., from 371 Center Street to Claremont Bldg., Chicago, Ill.

Palmer, A. R., from New Castle to 200 Penn Street, Braddock, Pa.

Swartz, T. B., from 77 39th Street, to 3543 Cottage Grove Avenue, Chicago.

Sterrett, J. K., from 6200 Penn to 122 Collins Avenue, Pittsburg, Pa.

Valentine, L. P., from Western Union to Somers, Wis.

Wiggins, O. C., from Kingstone, R. I., to Keysville, Va.

LETTERS RECEIVED.

Ashton, A. S., Piqua, Ohio; Ambrose, O. A., St. Louis, Mo.; Applegate, J. C., Bridgeton, N. J.

Beard, R. O., Minneapolis, Minn.; Bufkin, C. W., Runnells, Iowa. Battle Creek Sanitarium, Battle Creek, Mich.; Baker, H. B., Lansing, Mich. Cheatle, C. M., Buda, Ill.; Caldwell, J. J., Baltimore, Md.; Clark, L. Pierce, Sonyea, N. Y.; Carrow, J. F., Marion, Mich.; Critchlow, J. F., (Mrs.) Salt Lake City, Utah.

Davidson, F. B., Fleetville, Pa.; David, E. L., Louisville, Ky.; Dexter Folder Co., Pearl River, N. Y.; Dewar, J. B., Cedar Springs, Mich.; Davis, L. W., Knoxville, Tenn.

Eshner, A. A., Philadelphia, Pa.

Graefe, Chas., (2) Sandusky, Ohio; Gage, W. V., McCook, Neb.

Hamill, J. R., Chicago, Ill.; Hotz, F. C., Chicago, Ill.; Hektoen, L., Chicago, Ill.; Hawkins, T. H., Denver, Colo.; Hausheer, W. V., Detroit, Mich.; Hodges, J. Allison, Richmond, Va.; Holmes, Bayard, Chicago, Ill.; Hirth, Geo. J., Milwaukee, Wis.; Hoffman, D. S., Lake City, Colo.; Haggard, W. D., Jr., Nashville, Tenn.

Kaull, W. M., Princeton, Ill.; Knapp, M. S., Trenton, Mich.; Knight S. Helen, New York, N. Y.

Lea Bros. & Co., Philadelphia, Pa.

Moore, H. C., Beeville, Texas; Metcalf, Wm. F., Detroit, Mich.; Manitou Mineral Water Co., Manitou, Colo.; Montgomery, A. B., Reynolds, Ill.; Murphy, J., Sherman, N. Y.

N. Y. Post-Graduate Medical School and Hospital, New York, N. Y.

Philadelphia Medical Publishing Co., Philadelphia, Pa.; Paquin Laboratories, St. Louis, Mo.

Rush Medical College, Chicago, Ill.; Roosa, D. B. St. John, New York, N. Y.

Simplex Lamp Mfg. Co, Brooklyn, N. Y.; Shastid, T. H., Battle Creek, Mich.; Smith, Kline & French Co., Philadelphia, Pa.; Spring, Edwin H., Gloucester, Eng.; Stedman, A., Denver, Colo.; Schuster, Ed. & Co., Milwaukee, Wis.

The Maltine Co., New York, N. Y.; Talbot, Newton, Boston, Mass.; Tuley, H. E., Louisville, Ky.

Vaux, F. Leonard, Ottawa, Ontario.

Walker, H. D., Detroit, Mich.; Whitehead, W. H., Atlanta, Ga.; Walling, P. A., Park Rapids, Minn.; Winslow, J. R., Baltimore, Md.